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THE FOUNDRY TRADE JOURNAL IS THE OFFICIAL ORGAN OF THE INSTITUTE OF BRITISH FOUNDRYMEN; THE WELSH ENGINEERS' AND FOUNDERS' ASSOCIATION, AND THE FOUNDRY TRADES' EQUIPMENT AND SUPPLIES ASSOCIATION.

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The Newcastle Convention.

Even if trading conditions had been excellent, no better conference could have been staged by Tyneside foundrymen than that held last week. We well remember that, in 1924, the social side was more elaborate, but this very elaboration takes something away from the business and technical aspect. As it was, the balance was excellent, and gave at least an hour or two for informal chats, a matter sometimes impossible by the multiplicity of social engagements. The civic and other "official welcome" speeches were of proper proportions and to the point, and the time schedules well adhered to. Mr. Stobie, the newly-elected President, gave an admirable address of somewhat novel character. He envisaged a wrought cast iron as a competitor for many jobs normally using the cast material. We could not help thinking, as we listened to the address, of the potentialities of the bastard steel melted in the cupola, using coated coke; of weldings; of the ability of the new rotary pulverised-fuel-fired furnaces to produce any composition, and of quick-anneal malleable. Against all these we still balanced the rigidity of cast iron, and whether the introduction of a modicum of elasticity would not, in many cases, be detrimental. These, we presume, were the very thoughts the new President wished to arouse.

We have seldom known the award of the Oliver Stubbs medal more cordially applauded than when it was presented to Mr. J. E. Hurst, our predecessor in this chair. His pioneer work in the development of the centrifugal casting as a commercial proposition and his later work on the nitrogen-hardening and heat-treatment of cast iron is recognised internationally as being of fundamental importance in the extension of the use of cast iron.

Mr. Williams has been promoted to Senior Vice-President, and the esteem with which he is held in Institute and in South Wales business circles almost guarantees in advance the success of next year's conference. The election of Mr. Roy Stubbs to the position of Junior Vice-President was indeed popular. He bears a name which is highly esteemed in the foundry world, but his work and enthusiasm for the industry will add lustre to his families' escutcheon.

The Papers read at the Sessions at which we were present certainly provoked interesting and enlightening discussion, especially the very suggestive Paper of Dr. Rosenhain. Foundrymen know that he possesses a mine of information and were not backward in their requests, nor he (was the lecturer) hesitant in giving the very latest information available.

The annual banquet was excellently stage-managed, and the industry is indebted to the small committee responsible for its smooth working. In fact, the organisation was so good that one never noticed there was one! Mr. Eckford, Mr. Gresty, Mr. Logan and Mr. Scott earned and deserved the praise showered upon them by their guests.

A feature of this conference was the works visits. Practically everybody visited the works of Sir W. G. Armstrong-Whitworth (Ironfounders), Limited, as they were kind enough to open their works on two consecutive days. The visitors were astounded at the elasticity which was afforded by the plant, a 10-ton, two 5-ton and a 2-ton Sesci rotary pulverised-fuel-fired furnaces. The clockwork precision of operation, the fluidity of the superheated metal, the simplicity of the operating details and the quality and range of products made a great impression upon the visitors, and the opinion was generally expressed that the new system it represents had now taken a permanent position in the British ironfounding industry.

Visitors returning from Consett were heard to express the opinion that it was the politicians and not the iron and steel industry which required reorganisation, as the plant they had seen compared more than favourably with the best Continental practice.

Those interested in handling materials visited the foundries of Smith, Patterson, as there are few foundries in Great Britain where movements are more intelligently carried out than in this large chair foundry. The principal "exhibit" at the North-Eastern Marine Engineering Company was the "Perlit" process, where the system has reached a very high state of perfection, and is responsible for the turning out of the very highest grade of iron castings. The great switchgear manufacturers, Messrs. Reyrolles, also acted as hosts, and the visit left the members with the impression of the complete suppression of "Meccano" in switchgear through the marriage of the best principles of electrical with mechanical engineering. Their contribution to this branch of electrical engineering is indeed a distinguished one. Never in the history of the Institute were its members more deeply appreciative of the efforts made by the hosts for their enlightenment and entertainment.

Need for Action.

The iron and steel trade will have heard with very great satisfaction the results of the conference between the Import Duties Advisory Committee and the representatives of the trade. The Committee accepts what the steel trade has been saying for some years, that an efficient iron and steel industry is essential to the economic progress of this country and vital to our national security. Hence the imposition of a total duty of 33⅓ per cent. on certain classes of iron and steel products until a permanent scheme can be framed. The industry is to reorganise itself on lines which will permit production to take place without undue increase in price to consumers in this country, many of whom are exporters.

What is the position of the foundry industry in all this? It is perfectly natural that the committee of the steel industry, already formed, should represent the great steel producers, and that the National Federation of Iron and Steel Manufacturers should act on behalf of the trade. But we suggest that foundries are also concerned with competition by imports, and the National Federation is only concerned with foundries incidentally and in so far as they belong to the blast-furnace and steel plants. Founding is an essential link in the producing chain. It stands to gain much by the general revival of industry consequent on the protection of the steel in-

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dustry. Can it remain outside the present discussions? A situation of this kind is, in fact, one of those critical periods which demands representation of the industry in proper quarters by an all-embracing manufacturers' association. The weakness of the industry is that there are several associations, although they could readily arrange to act in concert. Unfortunately, they are also not fully representative. The National Federation is strong because it is all-embracing and represents almost the entire industry. Furthermore, it sponsors the Iron and Steel Industrial Research Council, so that it can say with truth to the Tariff Committee that it is taking steps to make itself efficient and hence to justify protection.

If the founders' associations were to combine to make representations to the Tariff Committee and to make arrangements to support the Cast Iron Research Association they could make out a case for much better treatment than they have hitherto received. Otherwise, when the melon is cut there will be little for them; indeed, if the case goes by default the industry would deserve little, for that would imply that it is perfectly satisfied and has nothing to ask or to hope for.

Correspondence.

"How Long?"—At Last.

To the Editor of The Foundry Trade Journal.

Sir,—I have been patiently waiting for a lead on this subject of educational opportunity for budding foundry executives. This matter has been mentioned in the Council of the Institute of British Foundrymen and received a definitely cool reception. The possibilities of difficulty in raising a sufficiently large amount of cash seem to loom so great that no one seems likely to take the matter in hand.

If we were a religious body (I mean as a body, not as at present, individual members of different religious bodies) and desired a new church, we should go ahead and pay sometime.

We are, as a body (Institute of British Foundrymen), the only organisation, as far as I can see, capable, if willing, to initiate this scheme, and must first be brought to a realisation of the necessity of it being brought into existence.

If we get the necessity idea stuck right into our minds, I think we shall find ways and means to bring it about.

Unfortunately, we have a long time to wait for the next Council meeting, but I do wish that each Branch would go into the question of whether it is desirable that a committee should be formed to consider the advisability of arranging a scheme to be put before the Council and then before the Branches to find the approximate cost. The institutes or organisations outside ours likely to become interested and to help to outline a scheme (presuming we have the necessary money to enable us to do what we think requisite), that will cover the erection, if required, the lay-out of the college and works, the staffing and the necessary qualifications of entrants, as well as the qualification to enable students to take a degree.

This, of course, is a rough outline of a nebulous idea that will take a lot of developing as well as financing before we can make a start. There are men in the Institute and in the industry capable of doing this, but we must all realise that sacrifices must be made now for our future benefit.

May I say, in conclusion, that it will serve no useful purpose anyone suggesting the impossibility of raising the money. What I should like is an expression of opinion. Is the idea good and sufficiently necessary?—Yours, etc.,

E. M.

Leicester.
June 6, 1932.

Conference Quips.

Specially Contributed by F. S. R.

This was the Merriest Conference ever. Foundrymen, casting their carking cares into the black abysses whence they came, relaxed in the influence of friendly smiles and became boys again.

* * *

Never was a year when they were so genuinely glad to see each other. After the industrial storms that had buffeted most of them for twelve weary months, it was a joy to see the old familiar faces, a joy tinged with a hint of the relief with which one shipwrecked mariner finds another safe and sound on a hospitable beach after all, and suddenly realises anew that friendship is the most precious thing in life, and there it is, preserved for him undimmed.

After all, money's only one thing in life. It's only good for the satisfaction it brings, and the best things in life cost nothing at all.

* * *

The New President just beamed around—one vast expanse of smile. It is believed that he smiles in his sleep in Conference week. His native hue, a compound of (1) Restrained Force, (2) Iron Resolution and (3) The Seeing Eye Tempered with Quiet Humour, give place to an air of General Benevolence that made him seem like an indulgent father.

He addressed his flock as "Those who cast their daily bread in moulds," and warned them against the pitfalls in Text-books, and the risk of taking anything in metallurgy for granted.

* * *

The Seer of Coventry, the Retiring President (that great master of English Prose), was at the top of his form as a Coiner of Phrases, which fell from him like leaves in autumn gales.

In handing the Flaming Torch on to his Successor and bidding him keep it undimmed, he said that if he himself could keep the friends he had made during his own year of office he would always feel that it had been the most precious activity of his life.

Unaided, he felicitously installed the new President, and decorated him with the Chain of Office, his choice being then confirmed by the meeting, after Faulkner, V. C., had seconded the motion, with reminiscences of passages in the up-to-then unblemished boyhood of the President-Elect and himself. They "twa had paddled in the burn" in Auld Lang Syne, and we gathered that he wasn't a bit surprised that Victor should have turned out so well and done such credit to the uplifting influence of his early companions.

* * *

An outstanding feature of the Proceedings at the Annual General Meeting was the Pipe of Peace smoked by that Great White Chief Lake. This was a kind of a Chin-Resting Pipe, shaped like the figure 5 with the top knocked off, and the matter has been referred to the Research Association for investigation and report.

* * *

The appearance of Mr. Wesley Lambert, youthful, spruce and alert, shedding a year a month since his release from Daily Toil, was further evidence in favour of our very popular theory that Work is the Great Enemy of Mankind, that nothing really hurts us but Labour and that Toil is slowly but surely undermining our health.

* * *

Standing *outside* the door of a Bar, fragments of heart-to-heart talks drifted out to us from the members and the smoke within. "Soluble Starch as a Binder" seemed a stiff proposition. "So rushed," said a Scottish Accent, "that if we knew how to make them we have no time to say so!" "From where?" asked a stout voice with a Lancashire burr in it. "Yorkshire and proud of it," was the reply. "Yes," said the other, "such folk as you are," and then a steelfounder: "The real trouble," said he, "is that all my best customers are going bust but none of my competitors are." A voice murmured: "Yes, but the minute you start grumbling you start progressing," and we seemed to have heard the phrase before in a gentle Irish Brogue.

And so on; everybody very jolly and pulling legs as happily as sandboys.

* * *

"Technical men," declared the Master of Phrases, "should not be at the mercy of the Waves and Winds of Industrial Storms," and the Highbrows around murmured assent, thinking he meant them (which he didn't), till John Bull, of South Shields, let fly at them. We thought he would have liked to put them in a Home! "'Tsno use," said he, "making high-class material to put into bad moulds, or bad iron to put into good ones." "You come back," said he, "to the Craftsman," and urged the President to stress that aspect for a year and let the "Technical" side lie dormant.

And then the wigs were on the green, until peace was restored with honour by the I.P. President explaining that when he said "Technical" men, he meant Moulders and Coremakers and Uncle Tom Cobley an' all.

* * *

"Gentlemen, 'The Ladies,'" and are we not grateful to those who graced the Conference with their presence, and with their smiles and charm adorned it like June Roses.

Strong men, who had for weeks and weeks debated internally the question of whether funds would run to two this year, and had decided to chance it and bring the wife, looked unsympathetically upon bachelors and coldly upon married men who had come alone, whilst Weak Men, who had decided in the negative and pictured to themselves the wee wifie waiting lonely in the cold home, ground their teeth and slunk secretly to their chambers to write sadly to their Life Partners.

* * *

We cannot close without a grateful reference to the Gardkard Trio (amateur knockabout variety artistes), whose extraordinary facility in balancing glasses of ale upon their heads delighted an astounded audience at the Station Hotel. It is freely rumoured that these Acrobats have been engaged at enormous expense and will shortly top the Bill at the Palladium as the "Malleable Medley."

* * *

And so passed a Very Happy and Pleasant Gathering of the Foundry Clans, and here's hoping that all who were by divers causes prevented from being present will glean from the Reports a hint of our gladness and be able to come themselves next year (and bring their wives!).

Ajax-Northrup Installation.—According to an article in a recent issue of "Heat Treating and Forging," the total kilowatts of Ajax-Northrup furnaces installed up to 1932 is 32,500. The increase since 1927 has been very rapid: 25,000 kw. having been installed in the past four years.

"Crusco."—This is the name given to a new alloy steel perfected by Dr. Bezzenberger, technical director of the Cosma Laboratories. It is used in the manufacture of piercing points and rolling-mill plugs, and is claimed to possess remarkable properties. The constituents are chrome, vanadium, tungsten, cobalt and nickel.

INSTITUTE OF BRITISH FOUNDRYMEN.

TWENTY-NINTH ANNUAL CONVENTION AT NEWCASTLE-UPON-TYNE.

The 29th Annual Conference of the Institute of British Foundrymen, held at Newcastle-upon-Tyne from June 7 to 10, under the Presidency of Mr. Victor Stobie, M.I.E.E. (of the Stobie Steel Company), was most successful throughout, both from the instructional and the social points of view, and the Newcastle Branch worthily maintained the reputation it established as host in 1924, when the Institute's annual conference was last held in that city. In addition to the technical meetings, many visits were arranged to various heavy engineering works which abound in this area, and the civic, industrial and educational authorities combined with the Newcastle Branch in the arrangement of the many social functions which the Institute's members and their ladies enjoyed. A special ladies' programme was arranged, as on previous occasions. Hearty thanks were expressed by all to the Executive Committee at Newcastle, which consisted of Mr. C. Gresty (Chairman), Mr. A. Logan, Mr. W. Scott, Mr. R. J. Shaw (hon. treasurer) and Mr. J. W. Eckford (hon. secretary); and to the Ladies' Committee, consisting of Mrs. S. E. Dawson, Mrs. J. W. Eckford, Mrs. A. Logan and Mrs. W. Scott.

A Civic Welcome.

The members and their ladies assembled on Wednesday morning, June 8, in the lecture theatre of the Literary and Philosophical Society, when a welcome was extended to them by representatives of the civic, industrial and educational interests of the district, in the persons of the Deputy Lord Mayor of Newcastle (Councillor J. Crosby), the Sheriff of Newcastle (Councillor J. Leadbitter), Sir Arthur Sutherland (representing the Rt. Hon. Lord Joicey, J.P., the President of the Newcastle and Gateshead Incorporated Chamber of Commerce), and Sir William Marris, K.C.S.I., K.C.I.E., B.A., D.Litt. (Principal of Armstrong College, Newcastle, and Vice-Chancellor of the University of Durham).

These gentlemen were introduced by Mr. A. Harley, the retiring President of the Institute, who recalled the very happy conference which was held in Newcastle in 1924, and said that all the members were glad of the opportunity to visit the city again. He regretted that trade was not so good as it ought to be, but was of opinion that the tide was on the turn and felt sure that Newcastle and district would be in the forefront of the coming trade revival.

The DEPUTY LORD MAYOR first conveyed the apologies of the Lord Mayor of Newcastle (Councillor J. G. Nixon, J.P.), who had intended personally to welcome the visitors, but had had to travel to Ireland to attend to business matters. Newcastle (continued the Deputy Lord Mayor) was honoured by the fact that the Institute had chosen it as a suitable place in which to hold this annual conference. He appreciated that it was always difficult to choose the most suitable place for any conference, and Newcastle was sincerely honoured by the choice which had been exercised on this occasion by a body so important as the Institute of British Foundrymen. This conference was not merely of a national, but an international, character, and he expressed the hope that the Institute's deliberations would be helpful in every possible way. He personally had had a little experience of both national and international organisations set up for purposes such as the Institute had in view, and as a result of that experience he could say quite definitely that such association was of inestimable value in the improvement of the technique of an industry and in every way. The founding industry was basic to the great industries which had made Newcastle-upon-Tyne famous. If the work in the foundry were not well and truly done there was trouble later on all along the line.

The Deputy Lord Mayor expressed the hope that in connection with educational work the conference would be particularly and materially successful. He hoped also that the members would not overlook the value of the social functions, to which the city of Newcastle hoped to make its contribution. All work and no play made Jack a dull boy, and he was glad, therefore, that a little time was to be spared for play during the period of the conference.

Finally, the Deputy Lord Mayor extended a welcome to the ladies attending the conference, and assured them that they would find much of interest in the beautiful and interesting places situated around the city of Newcastle, and in the fine shops within the city.

MR. VICTOR STOBIE

(The newly-elected President of the Institute of British Foundrymen).

MR. STOBIE was educated at St. Maur's School, Paris, and in the electrical engineering and metallurgical departments of the University College, Sheffield. He created the Sheffield Annealing Works Company, where, with his patented gas-fired annealing furnace, he undertook the softening of bars of tool steel for the local industry. His furnace was so esteemed that many installations were made in Germany and the United States. In 1909 he formed the Stobie Steel Company, a pioneer concern for the manufacture of electric steel. After a few years this establishment was removed from Sheffield to Dunston-on-Tyne, where it later became an important factor for the production of munitions of war by the provision of special steels for the Services. Here Mr. Stobie utilised a number of furnaces of his own patented design, which, like the annealing furnaces, have found extensive adoption both at home and abroad. His latest invention, a high-frequency furnace, is, by arrangement, handled in this country by the General Electric Company. An invention of wide interest is the stereoscopic projection of kinematographic film pictures. Mr. Stobie holds membership in many technical institutes, and has presented Papers to the Iron and Steel Institute, the Institution of Electrical Engineers and a number of district technical associations.

Local Foundry Celebrities.

The SHERIFF OF NEWCASTLE (Councillor J. Leadbitter), supporting the cordial welcome extended by the Deputy Lord Mayor, said that but for coal and metals, the ancient city of Newcastle would not be what it is to-day. Unfortunately, trade was not good on Tyneside at the moment, but he expressed the hope that as the result of the deliberations at this conference some schemes would be formulated which would help the great industries not only of Tyneside but of the whole British Isles. His attendance at this meeting reminded him of two interesting facts. One was that a great friend of his in his young days was a working moulder, employed within a stone's throw of the building in which this meeting was being held, who had subsequently risen to great heights in the political world. It was Mr. Arthur Henderson, ex-Foreign Secretary (applause), who had contributed something towards the progress of the founding industry when employed as a journeyman in Messrs. Stephenson's foundry in South Street, Newcastle. Mr. Henderson was a Scotsman, possessing the Scottish tenacity and perseverance, and it was to that, in addition to his native ability, that one could attribute his achievements as a member of the British Government. The second fact to which the Sheriff referred was that when last he had attended a meeting in the lecture hall of the Literary and Philosophical Society it was for the purpose of hearing a lecture on steel, by an intimate friend of his, Professor Turner, of Birmingham. He was afraid, however, that he was very little wiser at the end of the lecture than at the beginning, because the materials which he had to mould were much more plastic than steel. (Laughter.)

Finally, he expressed the hope that the members of the Institute would derive much profit from their deliberations, and much pleasure from the social functions which had been arranged.

SIR ARTHUR SUTHERLAND, after expressing regret that Lord Joicey was unable to attend the meeting, extended to the Institute a cordial welcome on behalf of the industries of the district. He was afraid that the industries were passing through a depression which was world prevalent, but he pointed out that all stones, whether atmospheric or commercial, would rock themselves to rest, and expressed the hope that very soon we should see through the clouds some signs that the sunshine of prosperity would again shine upon us. In a reference to the excursions which the members were to make from Newcastle, Sir Arthur reminded the members that they were to visit Hadrian's Wall. In olden days, he said, there were stupid people who built walls to keep the Scotsmen out; nowadays, however, they were building railroads and motor roads in order to bring them in, because they were very valuable to the district, and for many years the industries there had been manned by Scotsmen.

An Industrial Survey.

SIR WILLIAM MARRIS, K.C.S.I., K.C.I.E., B.A., D.Litt., said that as Vice-Chancellor of the University of Durham and Principal of Armstrong College, Newcastle, he was glad of the privilege of joining in the expressions of welcome. The University, he said, was the university of a great industrial area, and Armstrong College in particular was concerned with many matters of interest to the great basic industries on which the prosperity of this part of the country rested. There were at the College big departments, such as those of civil, mechanical, marine and electrical engineering, and naval architecture, concerned with matters of great moment to the heavy industries, and, therefore, to the interests which the Institute of British Foundrymen represented. The College authorities were doing their utmost to help those interests, both by turning out students thoroughly well qualified to play their part in industry and by researches conducted by experts in the various departments, the results of which researches had been proved from time to time to be of material value to industry. They were anxious to do all they could to contribute to the recovery of prosperity to which all looked forward. Their

interests were very much those of industry itself; when industry was in a bad way, then they were in a bad way, relatively speaking, and no one would rejoice more than they when the position improved.

A particular matter in regard to which the College had endeavoured to manifest its value and interest to industry was that of the industrial survey of the heavy industries of this part of the country. It had been undertaken by Armstrong College at the request of the Government, and he hoped that the results would be made public shortly. To his mind, there had been regrettable delay in the printing and publication of the report; that was not the fault of the College, because the matter was taken out of their hands by the Government some time ago, but it was expected that the report would appear shortly, and he believed that in its pages there would be found a useful and sympathetic study of many matters which would be of interest to members of the Institute. During the forthcoming session at the College it was hoped to arrange for the delivery of a series of lectures by experts on particular points of interest emerging from the report. Finally, Sir William echoed the hope that the deliberations at the conference would be most valuable and profitable.

Presentation of Oliver Stubbs Gold Medal.

The Retiring President then invited the Deputy Lord Mayor to present the Oliver Stubbs Gold Medal—the premier award of the Institute—to Mr. J. E. Hurst, in recognition of his outstanding contributions to the metallurgy of cast iron, particularly in the form of new alloys. The Institute felt, he said, that Mr. Hurst's work in that direction would be of the utmost value to the industry, because it pointed to new opportunities for widening the uses of cast iron, which was, of course, the most valuable of all metals. (Laughter.) People talked of the gold standard, but he wished that we heard less of that and more of the cast-iron standard. Mr. Hurst's researches had shown that in the future the use of cast iron would be immensely greater even than in the past, particularly if the new alloys which were being studied were developed.

The Deputy Lord Mayor, presenting the medal to Mr. Hurst, congratulated him upon his success in this particular branch of metallurgy. Historically, he said, we knew that when the Iron Age had superseded the Bronze Age a tremendous step forward was made in civilisation. Evidently we were not yet near the end of the Iron Age.

The medal was presented amid applause.

Mr. Hurst, responding, said it was difficult to find words adequately to express his appreciation of the honour conferred upon him, but he assured the members that he did appreciate it sincerely and would do all in his power to maintain the honour in the future.

A Vote of Thanks.

The Retiring President proposed a hearty vote of thanks to the Deputy Lord Mayor and Sheriff of Newcastle, and to Sir Arthur Sutherland and Sir William Marris, for having expressed so cordial a welcome to the Institute. The Deputy Lord Mayor represented the chief citizen, and they and their colleagues concerned with local government could do so much to help industry by not allowing rates to become too high. The administration of a city such as Newcastle was a gigantic industry in itself. During his year of office as President he had had the privilege of meeting many Mayors and Lord Mayors throughout the country, and had been impressed in every case by their great devotion to duty, by their attention to the business side of their offices, and by the tremendous burden which these offices imposed upon them. They were doing everything possible to promote the interests of industry, for, after all, they realised that if there were no industries there would be no money with which to pay for local government. The Institute was deeply indebted also to the Sheriff of Newcastle.

Again, the Institute was grateful to Sir Arthur Sutherland, who occupied a very important position in the shipping world, and in many ways was a very valued citizen of the city; and to Sir William Marris, who had had a very distinguished career. The district was to be congratulated upon having the services of a gentleman of his educational attainments, and undoubtedly it would benefit industrially from the high standard of education which was given not only at Armstrong College but throughout the University of Durham as a whole.

Mr. J. E. Hurst
(*Oliver Stubbs Medallist*).

Mr. J. E. Hurst is the Technical Director of Messrs. Sheepbridge Stokes Centrifugal Castings Company, Limited, and also Technical Director of Messrs. Bradley & Foster, Limited, Darlaston. He has been intimately associated with the development of the centrifugal casting process in Great Britain, particularly in its application to special cast irons for high-duty purposes, and was manager of the Centrifugal Casting Department of Messrs. Newton Chambers & Company, Limited, which has now been merged into the organisation with which he is at present connected. Formerly he was Assistant Chemist to Messrs. Beyer, Peacock & Company, Limited, Locomotive Works, Gorton, Manchester. He became successively Chief Chemist and Metallurgist to Messrs. Richard Hornsby & Sons, Limited, of Grantham and Stockport, makers of gas and oil engines, and Chief Chemist and Metallurgist to Messrs. D. Napier & Sons, Limited, Acton, London, during the war engaged in the manufacture of aeroplanes and aeroplane engines. Subsequently he identified himself with the centrifugal casting process with Stokes Castings, Limited, Mansfield, and Centrifugal Castings, Limited, Kilmarnock. He has been actively engaged and interested in research work in connection with cast iron, and is the author of the well-known text-books "Metallurgy of Cast Iron" (Sir Isaac Pitman & Sons, Limited, London) and "Melting Iron in the Cupola" (Penton Publishing Company). He has made numerous original contributions to the Iron and Steel Institute, of which he is a member and a Carnegie Research Scholar, and also to various other societies and technical bodies. He is an active member of the Institute of British Foundrymen, being Junior Vice-President of the Sheffield Branch, and has lectured and presented Papers to practically every branch of the Institute. On the subject of Centrifugal Castings Mr. Hurst presented the Belgian Exchange Paper in 1924 and has presented a Paper to the American Foundrymen's Association in 1926. For some years Mr. Hurst has conducted extensive research into the possibilities of hardening and tempering various cast irons and alloy cast irons. Results of some of his investigations have been presented to the Institute of British Foundrymen in a series of Papers commencing in 1930. His most recent work is in the development of alloy cast irons suitable for nitrogen hardening, and the commercial development of Nitricastiron is entirely due to his work. In his recent Paper before the Iron and Steel Institute Dr. Fry, of Messrs. Fried. Krupp, Essen, Germany, the inventor of the nitrogen hardening process, generously acknowledged Mr. Hurst's work in extending this process to cast-iron alloys. The properties of aluminium-chromium cast irons suitable for this treatment were described in a Paper before the May Meeting of the Iron and Steel Institute. Mr. Hurst is also a member of the Council of the British Cast Iron Research Association and a member of the Staffordshire Iron and Steel Institute.

The vote of thanks was accorded with acclamation.

The Deputy Lord Mayor, responding, commented upon the Retiring President's reference to rating, and pointed out that the rates in Newcastle amounted to only 10s. in the £1, so that the administrative authorities had achieved some measure of success.

ANNUAL GENERAL MEETING.

The business of the Annual General Meeting was then proceeded with.

Greetings.

The Secretary (Mr. T. Makemson) announced that a number of messages of greeting had been received from foundry associations overseas. Mr. D. Avey, of the International Relations Committee of the American Foundrymen's Association, had cabled:—

"Please accept behalf American Foundrymen's Association cordial greetings and best wishes successful conference. Sincerely hope British foundrymen encounter early return prosperity."

Messages of good wishes were also received from Mr. Ronceray (President, French Foundrymen's Association), Mr. Ramas (Past-President, French Foundrymen's Association), and from Dr. Geilenkirchen, on behalf of the German Foundry Owners' Association.

A letter expressing good wishes was received from Mr. F. W. Finch, who was the Institute's hon. treasurer for many years, and who described himself as the oldest member of the Institute, and other such letters were received from a large number of members of the Institute who were unable to attend the conference.

Minutes.

On the motion of Mr. J. S. G. Primrose, seconded by Mr. Russell, the minutes of the preceding annual general meeting held at Birmingham on June 10, 1931, were taken as read, and were confirmed and signed.

Council's Report.

On the motion of Mr. R. A. Miles, seconded by Mr. F. W. Rowe, the annual report of the General Council for the session 1930-31 was unanimously adopted, without discussion.

ANNUAL REPORT.

In presenting the annual report for the year 1931-32, and the financial statement for the year ended December 31, 1931, the General Council have to record a year of steady progress in the usefulness of the Institute, in the number of members and in its financial position.

Membership Roll.

During the year May 1, 1931, to April 30, 1932, nine subscribing firms, 70 members (including 13 representatives of subscribing firms), 128 Associate members, 10 Associates have been elected, making a total of 217.

At the end of 1931 a drastic revision of the Membership Roll was carried out, and the names of non-paying members erased. The losses due to this revision, and to resignations and deaths amounted to 142; there is therefore a net increase of membership of 75. The Council notes with satisfaction that 19 members have transferred to higher grades.

Honorary Members.

The General Council have elected Mr. F. J. Cook, Past-President, and Mr. John Shaw honorary life members as a recognition of their services to the Institute over a period of many years.

Finance.

The accounts have been duly audited and the balance sheet certified by Messrs. J. & A. W. Sulley & Company, and a statement of accounts and balance sheet are included in this Report. The thanks of the Council are expressed to the

Sheffield Branch who voluntarily returned £50 from their accumulated funds to the general funds.

An analysis of the Membership Roll on April 30 last is given in the following table:—

Branch.	Subscribing firms.	Members.	Associate members.	Associates.	Total.
Birmingham	1 (2)	101 (95)	124 (115)	19 (19)	245 (231)
East Midlands	4 (5)	50 (45)	94 (96)	3 (2)	151 (148)
Lancashire	12 (7)	108 (105)	239 (185)	17 (13)	376 (310)
London	5 (5)	152 (158)	88 (85)	10 (12)	255 (260)
Middlesbrough	1 (5)	28 (27)	41 (42)	6 (8)	76 (82)
Newcastle	9 (8)	41 (46)	44 (50)	66 (69)	160 (173)
Scottish	6 (4)	83 (81)	181 (166)	15 (21)	285 (272)
Sheffield	7 (6)	76 (81)	75 (82)	10 (9)	168 (178)
Wales and Monmouth	1 (1)	27 (28)	32 (36)	— (1)	60 (66)
West Riding of Yorkshire	— —	36 (31)	54 (53)	2 (2)	92 (86)
Unattached	1 —	39 (28)	10 (9)	1 (1)	51 (38)
	47 (43)	741 (725)	982 (919)	149 (157)	1,919 (1,844)

The figures in brackets are for the year ending April 30, 1931.

Obituary.

The losses by death during the year number 16, and include several members who have taken an active part in the conduct of the Institute's affairs.

MR. OLIVER STUBBS, who died on January 4, was elected President in the year 1921, and again in the year 1923. During his term of office as President he visited the United States, and it was largely as a result of this visit and subsequent efforts on his part that the present close international relations between the various foundry associations were established. He was President of the National Iron Founding Employers' Federation from its inception until a short time ago, and the Oliver Stubbs Gold Medal which is awarded each year to a member of the Institute was established by the National Iron Founding Employers' Federation to commemorate his Presidency of both bodies. Until he was stricken by a serious illness in 1928 he took a very active interest in all the Institute's activities, and his wide experience and sound judgment were of inestimable value.

MR. J. E. H. ALLBUT was Honorary General Secretary from 1907 to 1913, and died on December 24 last. The Institute owes a great deal to the large amount of very devoted work which he carried out in the early years of the British Foundrymen's Association, as it was then called.

MR. W. G. HOLLINGWORTH, who was General Secretary from 1921 until the end of 1926, became seriously ill some time before his retirement from this position and never completely recovered. He passed away in December, 1931.

MR. H. C. DEWS, President of the London Branch, died after a very short illness in January. He was one of the Institute's younger members who had achieved much during his comparatively short career. He was establishing rapidly for himself a position of authority in connection with non-ferrous metallurgy, and at the time of his death was engaged on important work on the Institute's behalf as convener of the Non-Ferrous Sub-Committee.

MR. F. SANDERSON died in September, 1931. He was for several years the Honorary Secretary of the Newcastle Branch, and in this capacity gave much devoted and painstaking service to his Branch and to the Institute generally, until continued ill-health enforced his retirement from active work a few months before his death.

MR. J. OSWALD, who was President of the London Branch in 1911-12, passed away in March.

Birmingham and Coventry Conference.

The attendance at the 28th annual conference which was held at Birmingham and Coventry from June 9 to 12, was larger than at any of the Institute's Conferences with the exception of the International Conference in 1929.

The proceedings opened with a Reception given by the Lord Mayor and Lady Mayoress of Birmingham. At the Annual General Meeting on June 10, Mr. A. Harley was installed President, and on Thursday, June 11, the whole of the members and ladies journeyed to Coventry, where they were received in the historic St. Mary's Hall by the Mayor of that city.

The Conference demonstrated again the indebtedness which the Institute owes to the firms who permitted visits to their works, and to the authors of the Papers which were presented.

MR. ROY STUBBS

(Junior Vice-President of the Institute of British Foundrymen).

MR R. W. STUBBS was educated at the Victoria Park School, Manchester, and then at the Manchester Grammar School. He studied metallurgy, machinery, drawing and chemistry at the College of Technology, Manchester, and joined the firm of Messrs. Joseph Stubbs, Limited, where he spent many years in the foundry as moulder and coremaker, etc. Mr. Stubbs served in the war as a gunner in the R.F.A., and at the end of the war returned to an executive position in the foundry of Messrs. Joseph Stubbs, Limited. Later he joined the board of directors and is now in charge of the foundry. He joined the Lancashire Branch in 1919 and was President in 1930 and 1931, and also is a member of the Manchester Association of Engineers. He is a member of the Executive Board of the National Ironfounding Employers' Federation and of the Executive Committee of the Manchester and District Ironfounders' Employers' Association.

The Council wish to thank the Lord Mayor of Birmingham, the Mayor of Coventry, the authors of Papers, firms who permitted visits to their works, and all who subscribed to the Conference funds or assisted in any way in connection with its organisation. They especially wish to record their thanks to Mr. F. K. Neath and Mr. F. H. Hurren, the Honorary Conference Secretaries.

Examinations in Foundry Practice.

The scheme of examinations in Foundry Practice and Patternmaking undertaken in conjunction with the City and Guilds of London Institute, and described in the last Annual Report, was completed in the summer of last year, and immediate steps were taken to bring the syllabuses and the examinations to the notice of foundry proprietors, technical colleges and prospective students.

At the beginning of the Winter Session in October, twenty-nine colleges were operating classes leading up to these examinations. As was to be expected, a few of these classes were withdrawn owing to shortage of students, but twenty-three of them continued their work throughout the session.

The syllabus implies a course of three years, so that it will be at least two years before many of the new students are able to present themselves for the examination. The first series of the examinations, however, were held in April, 1932, and a number of students who had received preliminary instruction prior to the inauguration of the scheme presented themselves for this examination; additionally, thirty-five candidates who had not attended scheduled classes presented themselves for the examination as external students. Successful candidates will receive certificates which will be endorsed by the President of the Institute of British Foundrymen. Additionally, several classes are being held in preparation for the certificates issued by the Union of Lancashire and Cheshire Institutes. The third-year certificates in Foundry Practice of this body will also be endorsed by the President of this Institute.

In the course of their work the Advisory Committee realised that the principal obstacle to the success of this scheme would be the apathy of the persons for whom it was intended, namely, the foundry apprentices, but they feel that the results of the first year have been unexpectedly encouraging and have more than justified the establishment of the scheme.

The proportion of foundry apprentices who attend evening classes has always been exceedingly small, and the preliminary results of this scheme indicate that as it becomes better known other apprentices will be encouraged to follow the example of those who have gained the certificates, and in the near future it may be confidently expected that a much larger proportion of foundry apprentices will pursue technical studies than has been the case before. Even during its first year, the number of apprentices attending these classes has been probably greater than during any previous session.

The second portion of the Certificates Scheme consists of a modification suited to the requirements of the foundry student of the National Certificate in Mechanical Engineering, issued by the Institution of Mechanical Engineers and the Board of Education, and endorsed by the President of this Institute.

Six technical colleges of high standing have arranged courses for this modified certificate, and already six certificates have been signed by the President of the Institute in respect of National Certificate holders who have also attended the necessary additional courses in foundry work and metallurgy.

The Council appeal to all members of the Institute to interest themselves in these developments in foundry technical training, and bring them to the notice of the students and young men who are associated with them. Several Branches of the Institute have worked actively in conjunction with the employers and the technical colleges in their area with beneficial results, and the Council appeals to the remainder of the Branches to co-operate during the summer in their own areas in the same way.

Technical Committee.

The Technical Committee and its Sub-Committees have held a large number of meetings and

have carried out a considerable amount of correspondence.

In view of the large amount of work carried out by the Technical Committee, it is felt desirable that the members should have a complete report of its activities, and this Report is included in this booklet.

Oliver Stubbs Medal.

The tenth award was made in June, 1931, to Mr. John Cameron, J.P., Past-President, "who by his example has done much for the wider dissemination of foundry technique, particularly in the development of new methods dealing with foundry problems, and by his general activities has contributed to the advancement of the technical side of the industry."

Diplomas.

Five diplomas were awarded in June, 1931, for Papers given before the Branches during the previous session, the names of the recipients and the Branches before which the Papers were presented being as follow:—Mr. G. M. Callaghan, Birmingham Branch; Mr. F. Harris, Lancashire Branch (Burnley Section); Mr. J. K. Smithson, Middlesbrough Branch; Mr. R. Liddle, Scottish Branch; and Mr. J. Hird, Wales and Monmouth Branch. The announcement for the award of the diplomas for the session 1931-32 was made at the annual general meeting on June 8.

Buchanan Medals.

The Buchanan Medal is awarded to members of Junior Sections. During the session 1930-31 entries were received from the Lancashire Branch Junior Section only, and the examiners awarded one Buchanan Medal to Mr. Ben Haigh, of the Lancashire Branch Junior Section.

Surtees Memorial Examination.

The Surtees Memorial Fund was instituted by Mr. W. Mayer, Past-President, and the prizes are awarded from a bequest which was left by Mr. Mayer. The examinations are conducted by the Scottish and Newcastle Branches in alternate years. The 1932 examination was held by the Scottish Branch, and the following awards were made:—Senior Grade: Gold medal, Mr. Robert Macnab; second prize, Mr. A. L. Mortimer; and third prize, Mr. David Webster. Junior Grade: Silver medal, Mr. Robert P. Clark. Prizes were awarded to:—Mr. James Liddell, Mr. Walter McArthur, Mr. David Slater, Mr. Isaac Wilson and Mr. William Cassidy.

John Wilkinson Medal.

The examination for this medal is open to members of the Lancashire Branch Junior Section. The 1931 Medal was awarded to Mr. J. Holmes.

Overseas Foundry Associations.

The outstanding international event during the year was the International Foundry Conference and Exhibition, which were held in Milan. About thirty members of the Institute and ladies attended this Conference, and many of them afterwards joined in an extensive tour of the industrial portion of Northern Italy, and continued to Rome, where the Conference was formally closed by Signor Mussolini.

The Institute has accepted an invitation to participate in the World Foundry Congress and Exhibition to be held in Paris in September, 1932. Particulars of the programme and travel arrangements which are being made will be circulated to members in due course. The Council are particularly pleased to report that the President, Mr. Andrew Harley, has been elected President of the International Committee of Foundry Technical Associations for the year 1932, and will participate in the World Conference in Paris in this capacity.

A meeting of the International Committee of Foundry Technical Associations was held in Milan in September, 1931, and at this meeting the Institute was represented by Mr. John Cameron, Past-President, and by the General Secretary, who is also hon. secretary of this Committee.

Exchange Papers were presented on behalf of the Institute by Mr. V. C. Faulkner at the Convention of the American Foundrymen's Association in 1931, by Mr. J. H. D. Bradshaw at the Conference of the French Foundry Technical Association in 1931, and by Dr. A. L. Norbury at the International Foundry Conference in Milan.

Mr. H. J. Young has prepared the official Exchange Paper for presentation to the Convention of the American Foundrymen's Association to be held in Detroit in May, 1932, and Prof. D. Hanson is preparing the Exchange Paper for the World Foundry Conference to be held in Paris in September.

The Overseas Associations have arranged reciprocal Papers, and at the Conference of the Institute to be held at Newcastle in June, Papers will be presented by Mr. R. F. MacPherran, on behalf of the American Foundrymen's Association, and by Monsieur J. Pillon, on behalf of the French Association.

Mr. J. W. Eckford
(Honorary Convention Secretary).

The Institute continues to co-operate with Overseas Associations directly and through the International Committee on many matters of interest to its members, and on many administrative matters, and it was fully represented at the meeting of the International Cast Iron Testing Committee held in Milan last September.

Kindred Associations.

For many years the Institute has had increasingly close and cordial relations with other technical associations representing different branches of the industry. Several of the branches have held joint meetings with the respective local sections of kindred associations and with local engineering societies. Such cordial relations have proved to be of considerable benefit to the members of the Institute and of other bodies concerned.

British Cast Iron Research Association.

The efforts of the British Cast Iron Research Association to increase its income from the industry to meet the fall in the Government grant while attended with a gratifying measure of success, did not reach the required figure on account of the economic condition of the industry. In these circumstances the Government agreed to fix a maximum grant of £3,000 for the years 1931-32 and 1932-33, subject to the Association raising from the industry the total sum of £6,250 for the first year and £6,500 for the second year. Subsequently, the Association will be required to raise the original figure of £7,500. It is hoped that the required figure for the current year will be reached, so that the income will balance expenditure, which has been diminished by various economies and staff-salary reductions.

The original programme of investigation undertaken by the Association on the influence of various elements acting jointly in cast iron is approaching completion, and the Research Committee is now planning the programme to be pursued for the next few years. Among the important developments which have taken place are those of some new austenitic cast irons, particularly an iron called Nicrosilal, which is the best cast iron hitherto produced for resistance to heat, and which is a development of Silal, referred to in the last Report.

The balanced blast cupola continues to make remarkable progress and the number of furnaces in operation now approaches a score, on grey and malleable iron. The usual fuel saving is of the order of 25 per cent. to 40 per cent., combined with exceptionally hot metal. Six leading manufacturers have been licensed by the Association to make this cupola. The work on moulding sands has continued, particularly with respect to core sands and refractories. The work done on moulding sands has been strikingly vindicated in a Paper, by Mr. W. Y. Buchanan, to the Scottish Branch of the I.B.F.

Branch Activities.

In response to requests, a Section of the East Midlands Branch was formed at Lincoln during the summer, and has now completed a successful first session's work. In November a Section of the Lancashire Branch was organised at Preston to cater for the large number of founders in Northern Lancashire who wish to meet together regularly to discuss their problems. Nearly eighty members joined the Institute as a result of the formation of this Section.

At the end of November the Scottish Branch held a meeting in Edinburgh, as a result of which arrangements have been made to hold meetings in that city in the interests of present and potential members resident in the district.

The Branches of the Institute have completed successfully a series of lectures, works visits and social functions. In some cases these activities have been carried on in face of considerable difficulties due to the depressed state of trade in certain areas. The President has visited most of the Branches during the past winter and wishes to record his admiration for the devoted work of the Branch officers and Councils.

The number of Papers given before the Branches and Junior Sections was 85, also several informal discussions have been held. These activities are additional to the Papers and visits arranged in connection with the Annual Conference.

By-Laws.

The increasingly wide activities of the Institute and its developments have indicated for some time the necessity of certain alterations in the by-laws. A small committee of the General Council was appointed to prepare a draft revision of the by-laws, and very shortly this committee hopes to present its proposed draft by-laws to the members for their consideration.

General Council.

Four General Council meetings and a large number of committee meetings have been held at Birmingham, Sheffield, London and Blackpool; in addition, the Technical Committee and its sub-committees have held numerous meetings at various centres, and meetings have also been held by the Advisory Committee which works in conjunction with the City and Guilds of London Institute and by its sub-committees.

The average attendance at the General Council meetings was 46. The General Council consists of:—(*a*) Past-Presidents of the Institute, (*b*) members elected by the Branches, (*c*) Branch-Presidents and Secretaries, and (*d*) ten members elected at the Annual Conference for two years (five are elected each year).

The five members elected in June, 1930, who retire at the annual general meeting on June 8, 1932, are:—Messrs. A. R. Bartlett, A. Campion, F. H. Hurren, J. R. Hyde and W. Jolley. Messrs. Campion and Hyde offer themselves for re-election.

The General Council wish to express their thanks to Mr. W. B. Lake, J.P., for his energetic work as honorary treasurer. The Council also wish to record their thanks to the authors of the many Papers which have been presented; the directorates and staffs of the works which have been visited; to the Branch-Presidents and Secretaries; and to all the members who have contributed to a successful year's working by their active co-operation.

Newcastle Conference.

The twenty-ninth Annual Conference will be held at Newcastle-upon-Tyne from June 7 to 10, when Mr. Victor Stobie, M.I.E.E., President-elect, will be installed President of the Institute.

A. HARLEY, *President.*
T. MAKEMSON, *General Secretary.*

BALANCE SHEET, DECEMBER 31, 1931.

LIABILITIES.

	£ s. d.	£ s. d.
Subscriptions paid in advance		165 13 10
Sundry Creditors		421 10 5
The Oliver Stubbs Medal Fund:—		
Balance from last Account	201 11 2	
Interest to date	7 16 9	
	209 7 11	
Less Cost of Medal	8 10 0	
		200 17 11
The Buchanan Medal Fund:—		
Balance from last Account	111 7 3	
Interest to date	4 14 9	
		116 2 0
International Conference Fund:—		
Surplus included in General Investments		40 18 11
Accumulated Fund:—		
Balance at December 31, 1930	1,354 1 1	
Add: Excess of Income over Expenditure for the year ended December 31, 1931	74 9 10	
		1,428 10 11
		£2,373 14 0

ASSETS.

	£ s. d.	£ s. d.
Cash in hands of Secretaries:—		
Lancashire	37 18 6	
Birmingham	87 5 7	
Scottish	54 10 8	
Sheffield	33 12 5	
London	80 2 1	
East Midlands	31 5 0	
West Riding of Yorkshire	27 3 3	
Wales and Monmouth	22 5 4	
Middlesbrough	15 10 7	
		389 13 5
Lloyds Bank Ltd.		370 11 7
The Oliver Stubbs Medal Fund:—		
£342 5s. 7d. Local Loan £3 per cent. Stock at cost	200 0 0	
Balance at Lloyds Bank Ltd	0 17 11	
		200 17 11
The Buchanan Medal Fund:—		
£125—£3 10s. Conversion Stock at 78¼	98 6 9	
Balance at Midland Bank Ltd.	17 15 3	
		116 2 0
Investments Account:—		
£450 5 per cent. War Loan at cost	430 9 10	
£300 5 per cent. Conversion Stock 1944-64 at Cost	297 14 11	
£653 19s. Local Loans 3 per cent. Stock at Cost	451 13 8	
		1,179 18 5
Furniture, Fittings and Fixtures:—		
Per last Account	77 4 1	
Additions during year	52 5 6	
	129 9 7	
Less: Depreciation 10 per cent.	12 18 11	
		116 10 8
		£2,373 14 0

INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED DECEMBER 31, 1931.

EXPENDITURE.

	£ s. d.	£ s. d.
Postages		119 19 3
Printing and Stationery, including printing of "Proceedings"		664 3 9
Council Finance and Annual Meeting Expenses		99 10 2
Medal for Past-President		2 5 0
Branch Expenses:—		
Lancashire	120 5 0	
Birmingham	74 18 9	
Scottish	77 0 0	
Sheffield	131 4 6	
London	56 13 8	
East Midlands	48 15 10	
Newcastle	53 19 0	
West Riding of Yorkshire	23 19 7	
Wales and Monmouth	20 7 8	
Middlesbrough	36 4 0	
		643 8 0
Audit Fee and Accountancy Charges		12 12 0
Incidental Expenses		69 4 4
Salaries—Secretary and Clerks		641 11 11
Rent and Rates of Office, less Received		99 17 6
Income Tax		10 2 6
John Surtees Memorial Examinations: Grants to Branches		8 8 1
Subscription International Committee		5 0 0
Depreciation of Furniture		12 18 11
		2,389 1 5
Excess Income over Expenditure carried to Balance Sheet		74 9 10
		£2,463 11 3

INCOME.

	£ s. d.
Subscriptions Received	2,356 9 6
Sale of "Proceedings," etc.	13 10 5
Interest on Investments and Cash on Deposit	51 16 6
John Surtees Medal Fund, Surplus	30 18 5
Surplus on Sales of Badges	10 16 5
	£2,463 11 3

We have prepared and audited the above Balance Sheet with the Books and Vouchers of the Institute, and certify the same to be in accordance therewith.

J. & A. W. SULLY & CO., *Chartered Accountants, Auditors.*

19-21, Queen Victoria Street, London, E.C.4.
April 6, 1932.

Balance Sheet and Accounts.

MR. W. B. LAKE, J.P. (hon. treasurer of the Institute), proposed the adoption of the balance sheet and accounts for the year ended December 31, 1931, which had been examined by the Finance Committee and the General Council and circulated to members with the annual report. The outstanding feature of the accounts, he said, was that the Institute was a little better off at the end of 1931 than at the end of 1930. Whereas the credit balance on the year's working in 1930 was about £4, the balance in 1931 was about £74. Unfortunately, however, the prospects for the current year were not so good, and it would be very necessary for all branches to exercise the greatest economy if the accounts were to square at the end of the year.

One item of good news was that, following a suggestion by Mr. Stobie (President-Elect), the secretary and auditors had been successful in obtaining a decision that the interest on the Institute's investments should be free of income tax. This would result in the repayment of a sum of about £84 and an annual saving of about £20. The thanks of the Institute were due to Mr. Stobie and to the secretary and auditors for their endeavours in this respect.

MR. J. S. G. PRIMROSE, seconding the resolution for the adoption of the Balance Sheet and Accounts, urged the opinion of the Lancashire Branch that in future the accounts should include details of the subscriptions received by the Branches and not merely the expenses incurred by the Branches. Details of the Branch subscriptions would have shown that the subscriptions from the Lancashire Branch in 1931 amounted to £554, representing 24 per cent. of the total income of the Institute from subscriptions.

The Balance Sheet and Accounts were adopted.

Report of Technical Committee.

MR. J. W. GARDOM (Convener of the Technical Committee), proposing the adoption of the Committee's Report, which was combined with the Council's Annual Report, said it was the Committee's first report. He appreciated that it was not a big report and that it did not cover a lot of ground, but he pointed out that the Committee, like a marathon runner, was not starting with a sprint, but was making steady progress. The report should be considered as embodying the nuclei from which the future work of the Technical Committee could expand to something really good and worthy of the Institute.

Mr. Gardom took the opportunity to express thanks to Mr. Wm. Jolley, the former Convener, for the work he had done on the Committee.

MR. F. J. COOK (Past-President), seconding the motion for the adoption of the report, congratulated the Committee upon the great strides it had made in the short time which had elapsed since its inception. The Convener of the Committee had referred to the work in a very modest manner, but, nevertheless, it would redound to the credit of the Institute and to the members of the Committee.

The RETIRING PRESIDENT voiced the Institute's regret that Mr. Jolley had resigned the office of Convener of the Technical Committee for reasons of ill-health, and expressed the sincere hope that his health would soon be fully restored and that at some future date the Institute would again have the advantage of his services in an active capacity. The report contained a summary of the Committee's activities, and among the Papers to be presented to the conference was one giving an account in more detail of the work of the Malleable Iron Sub-Committee. The Technical Committee represented a department of the Institute's activities that was demanding more and more attention, not only with regard to its scope but also its organisation, and he felt sure that under Mr. Gardom's chairmanship the work would be among the most notable ever initiated by the Institute.

The report was unanimously adopted.

FIRST REPORT OF THE TECHNICAL COMMITTEE.

During the year 1930 the General Council considered it advisable that the Institute should have a Committee which would be the medium for dealing with various questions of a technical character which were submitted to the Institute. This Committee would also be a connecting link between the Institute of British Foundrymen and other technical bodies with whom the Institute co-operates on a technical basis. In October, 1930, the Technical Committee was formed for this work. It is constituted of two

members of each Branch, these members being elected at the annual meeting of the Branch. From this Committee the following five Sub-Committees were formed:—

Cast Iron. Non-ferrous. Steel.
Malleable Iron. Sands and Refractories,

and each Sub-Committee co-opted other members who were experts on the different subjects.

As these Committees have now had over twelve months' activity, during which eight meetings and numerous Sub-Committee meetings have been held, it is felt desirable that a report should be presented to the members of the Institute indicating the work which has been done up to date.

For the first part of its work the Committee decided to confine itself mainly to exploratory work, with the object of examining, analysing, tabulating by special card system, and correlating knowledge which was already in existence, and to point out the directions in which further information could be usefully sought by way of research or otherwise. If the General Council considered the research work reported upon was to the advantage of the industry, it could then be handed over to the British Cast Iron Research Association to enable them to proceed with further researches if they so desired.

To further co-operate between the Institute's Technical Committee and the British Cast Iron Research Association, a Liaison Committee has been formed consisting of two members of the Technical Committee and two members of the B.C.I.R.A., and the following scheme is the scope of the Institute's Technical Committee's activities and of its co-operation with the B.C.I.R.A.:—

(1) To act on behalf of the Institute and to make recommendations in respect of any technical matter which may be submitted to the Institute by outside bodies and by the British Cast Iron Research Association.

(2) To keep in touch with representatives of the Institute on outside technical bodies, such as the British Standards Institute, and offer guidance on such technical matters as may be required from time to time; to ascertain, where desirable, the opinions of Institute members affecting the industry, which might be useful in framing recommendations to such representatives.

(3) To ascertain the views of the Institute members on current practice and difficulties in the industry with a view to finding what matters most urgently require investigation.

(4) To furnish the Research Association with material that may be required in connection with any investigation undertaken at the suggestion of the Institute, and as far as possible to furnish samples which would assist the Association in its general investigations, the results of these investigations to be available to the Institute Technical Committee.

(5) To collect and disseminate technical and scientific information of interest to the industry and to assist generally in the education of the industry.

(6) To furnish suggestions to the Association which might be of assistance in carrying out the latter's research programme. Copies of the Association programmes, when issued, are to be forwarded to the Technical Committee for their guidance.

At an early stage of the Technical Committee's work it was considered advisable to tabulate all references in the technical Press dealing directly or indirectly with foundry work. The Committee have done this, and also made such references available to all members of the Institute in the form of a periodical Bulletin which is circulated monthly by each Branch-Secretary. The Committee is indebted to Mr. V. C. Faulkner, Past-President, who compiles this Bulletin each month.

Each Sub-Committee has collected and tabulated specifications dealing with its own subjects, with a view to simplifying and standardising such specifications. They have also answered official queries addressed to the Technical Committee by Subscribing Firm Members of the Institute and other members relating to technical and practical problems of the foundry industry.

The Sub-Committees are so constituted that the arrangement of meetings is extremely difficult, the members of some Sub-Committees residing over 300 miles apart. Much of the business has of necessity been carried out by correspondence, which is rather slow, but the following brief reports of the various Sub-Committees show that a considerable amount of valuable work has been accomplished.

Wm. Jolley, *Convener,*
Technical Committee.

Sub-Committee on Cast Iron.

Convener: Mr. P. A. Russell, B.Sc.

This Sub-Committee has examined specifications for iron castings from 21 authorities, and

Mr. J. O'Sullivan

(Mr. O'Sullivan, who presented a Paper on the "Quantity Production of Grey-Iron Castings," is Foundry Superintendent, Messrs. Henry Ford & Son, Limited, Cork, Ireland).

has classified them on a standard card-recording system so that the information they contain is readily available for members of the Institute.

Each specification has been examined individually by all members of the Sub-Committee, and where they considered it advisable they have recommended that the firms are approached with a view to changing over to the recognised standard specification. The work connected with specifications is not yet completed.

The Sub-Committee have now assembled available published physical data on cast iron for: Specific gravity, specific heat, latent heat of fusion, thermal conductivity, thermal expansion and electrical conductivity. These figures are available to all members of the Institute on application.

At the present moment the Sub-Committee have under discussion questions relating to wear tests, contraction allowances, and high-test cast iron. They have drawn up a report on cast-iron testing for presentation to the International Committee on Testing Cast Iron summarising the work done by the Test Bar Committee of the Institute.

Sub-Committee on Non-Ferrous Metals.

Convener: Mr. J. S. G. Primrose, A.R.T.C., M.I.M.M.

This Sub-Committee has held several meetings under two sub-conveners, and in addition has done most of its work by means of correspondence, due to the wide geographical distribution of its members and co-opted helpers. With the object of standardising specifications governing the production of alloys, the Sub-Committee members have considered in detail the requirements issued by twelve firms and authorities, covering 67 alloys in 48 specifications, and further collections are solicited from interested bodies. Most of the specifications call for no comment; a few appear to be incomplete, and several are deemed capable of improvement on the lines of suggestions to be communicated to the firms concerned. One particular specification has called forth such divergent comments that it is clear that the diversity of uses may sometimes militate against the adoption of general specifications. A collection is being compiled in regard to the nomenclature and composition of proprietary alloys, and also standard data covering the important physical properties of non-ferrous metals and alloys, and this work is intended to be of use to the foundry worker. The first part of the data, dealing with the constants for thermal conductivity, electrical conductivity and specific heat has now been compiled, and is available to members upon application.

The chief work so far undertaken has been to collect and record experience as to the best method of casting separate test-bars of gun-metal, so as to obtain agreement as to the pattern and method of running, which will show the best properties of the alloy itself. Four types of test-bars have been selected, and when a sufficient number of results are forthcoming a report on the sub-committee's finding will be published.

Sub-Committee on Steel Castings.

Convener: Mr. R. J. Hyde, A.M.I.Mech.E.

Acting upon the original instruction, the Sub-Committee on Steel Castings have classified the existing steel casting specifications, and have approached various authorities, chiefly through the general secretary of the Institute, and asked them to be good enough to forward copies of their steel castings specifications. Thirty-five replies have been received, accompanied in most cases by a definite specification. The Sub-Committee have noticed that in very few cases a comprehensive specification is used. The majority use British Standard Specifications, and some have recently put this in as an alternative to their older specifications, and it is necessary for the contractor, when commencing his work, definitely to agree with the engineers as to which specification he is to work. Other specifications appear to be extracts from the British Standard Specification issued by the engineers under a distinctive number or reference letter.

The Sub-Committee have therefore prepared a report showing 16 detailed clauses which are given in the most complete specifications, and have entered opposite each of these clauses the demands of each separate specification. The test almost universally specified is the tensile test in its simplest form, namely, maximum stress and elongation. The cold-bend test is the next in order of general use, coupled with a drop test or destruction test. Very few specifications require the yield point or the reduction of area, and still fewer call for a Brinall test. Many of the other points refer to general instructions to the Inspector, so that, on the whole, reasonably uniform conditions are provided for.

We have presented our report with the 16 detailed clauses clearly shown, and it is therefore easy to compare all the tensile tests or all the Brinell tests, and one can readily judge whether any specification is reasonable when compared with the others.

The question of approaching an engineer and requesting him to modify his tests was fully discussed at two committee meetings, and it was decided that, for the time being, the particular test complained of must be regarded as a modified form of British Standard Specification, Class "C," and, therefore, we did not request the general secretary to take any further action.

A number of specifications for alloy steel castings were received, but as alloy steel castings are not within the scope of this Sub-Committee's instructions, we have done nothing with them.

On the whole, the Sub-Committee is satisfied that steel castings specifications appear reasonable and free from anomaly. Whether the very high quality called for could be reduced somewhat in order to meet foreign competition abroad, is a matter which should be carefully considered, and we believe the matter is being raised in competent quarters. The chief point of the proposition is that, if Continental and American steels can be supplied to lower specifications, it is unfair to handicap the British manufacturer by making him work to a standard specification which entails more expensive material.

Sub-Committee on Sands and Refractories.

Convener: MR. N. D. RIDSDALE.

Since the testing of foundry sands is only beginning to be appreciated and practised on a relatively small scale in this country, it will be realised that there are no specifications available which are worth mentioning, and this Sub-Committee felt that its first duty was to agree upon the methods of testing foundry sands.

The following decisions have been unanimously agreed upon:—

(1) That for the time being the consideration of the methods of sand testing should be confined primarily to green sands.

(2) That the consideration of methods of sand testing should be given in the first place to tests for foundry control rather than for research work.

Overhang Test.—It was decided to omit this test at present owing to its unsatisfactory nature.

Compression Test.—This test should replace the overhang test and should be undertaken with the size of test-piece recommended by the British Cast Iron Research Association, viz., a cylinder 1.128 in. dia. and 2½ in. long. This shape is more satisfactory than the American Foundrymen's Association test-piece 2 in. dia. 2 in. long.

Constant Ramming.—This could be done by the method adopted by Mr. W. T. Buchanan, mentioned in Dr. Skerl's Paper on "Sand and Sand Testing," given to the Institute at the Birmingham Convention, 1931,* whilst variable ramming could be performed by the method recommended by the Research Association in its Research Report on Sand Testing.

Permeability Test.—This test could be made on the Research Association permeability test-piece, and the permeability could be measured either by passing coal gas through it, according to the recommendation of the Research Association, or by passing a known volume of air through it at a given pressure and noting the time taken. Results by the two methods of measurement would then, no doubt, be comparable.

Moisture Test.—Experiments are being carried out on a member's suggestion for measuring the moisture content of sand by the difference in the electrical resistance of different sands.

A number of experiments were made by one member of the Sub-Committee to compare the two methods of measuring permeability in green sands. The results were very encouraging, and it was felt that the work should be followed up by further experiments, mainly on iron-moulding sands, in order to arrive at definite conclusions.

This Sub-Committee hopes that in a few months' time it will be possible to recommend to the Technical Committee certain definite conclusions as to the best methods of making simple foundry control tests on green sands, embodying the combined advantages of the several different types of test that are obtainable at present.

Sub-Committee on Malleable Cast Iron.

Convener: MR. J. W. GARDOM.

As requested by the Technical Committee, this Sub-Committee has collected as many as possible of the available specifications controlling the manufacture and inspection of malleable cast iron. The examination of these specifications showed that, generally, the foundation was governed by the British Standards Specifications (B.S.I.), Nos. 309 and 310, and it was considered advisable to press for the universal adoption of these specifications.

The possible improvement by the addition of clauses to make the specifications suitable for all requirements, was the work undertaken by the Sub-Committee. The experiments and discussions are fully reported in the *résumé* of work to be presented as a Paper by the Malleable Iron Sub-Committee of the Institute's Technical Committee at the Annual Conference of the Institute to be held in Newcastle in June, 1932.

Awards of Diplomas and Buchanan Medal.

The SECRETARY announced that Diplomas had been awarded to the following in respect of the past year as follow:—

MR. T. R. TWIGGER, for a Paper read before the Birmingham Branch on "Some Recent Developments in Automobile Cast Irons"; MR. W. WEST, for a Paper before the Lancashire Branch on "Low Total-Carbon Cast Irons and their Service to the Foundry Industry"; DR. GUIDO VANZETTI (of Milan), for a Paper read before the London and Lancashire Branches on "The Italian Steel Foundry Industry"; MR. W. Y. BUCHANAN, for a Paper before the Scottish Branch, on "Sand Testing in the Foundry"; and DR. H. W. SWIFT, for a Paper to the West Riding of Yorkshire Branch on "Modern Practice in Cast-Iron Testing."

Entries for the award of the Buchanan Medal had been received only from the Lancashire Branch. The medal was awarded only to members of the Junior Sections, and the examiners had awarded a Buchanan Silver Medal to Mr. Jack Holmes, of the Lancashire Branch Junior Section. (Mr. Holmes was the recipient, for the last two consecutive years, of the John Wilkinson Memorial Medal of the Lancashire Branch.)

ELECTION OF OFFICERS.

President.

The RETIRING PRESIDENT, proposing the election of Mr. Victor Stobie, of Newcastle, as President for the ensuing year, emphasised that he possessed every qualification for this important office, and would carry out the duties in a very efficient and dignified manner. Mr. Stobie was well known throughout the industry, in the development of which he had played a very distinguished part, and as the result of reaping some of the fruits of his efforts he had plenty of leisure in which he would be able to attend to the affairs of the Institute. The members could feel assured that under his guidance the Institute would go on to greater prosperity during his year of office. One could not say all that one felt on occasions such as this, said Mr. Harley, but he personally was proud that Mr. Stobie was to succeed him, and the Institute had every confidence in him as its President.

MR. V. C. FAULKNER (Past-President), seconding, said it was peculiarly fitting that he should have the opportunity of doing so, because he had had contact with Mr. Stobie from three angles. For five strenuous years he had been Mr. Stobie's assistant, and had found him to be a brilliant metallurgist and electrical engineer, a very fine linguist, an inventor and a just and enthusiastic employer. Secondly, both prior to that period and ever since, Mr. Stobie had been his friend, staunch and loyal. Thirdly, he had had contact with Mr. Stobie as a colleague in the Institute, and had found him both enterprising and enthusiastic. His well-known enthusiasm and enterprise for anything which he took in hand would make for the still greater success of this already successful Institute.

The resolution was carried unanimously, and Mr. Stobie was invested with the Presidential Chain and Badge of Office, amid prolonged applause.

Addressing the meeting, he said he felt very deeply the great honour that had been conferred upon him. He appreciated that brilliant examples had been set by his predecessors, men whose enthusiasm for their work had brought the Institute to the position it had attained; he would do his best to consolidate the position, and hoped that when he handed on the office to his successor the wheels would still be running as quickly and as sweetly as at present.

A Vote of Thanks to Mr. Harley.

The PRESIDENT said his first duty was most pleasurable and gratifying; it was to propose that the thanks of the Institute be accorded Mr. Harley for the wonderful things he had done for it during the past year. Mr. Harley had set a brilliant example, and one which would give his successors much to think about. His command of the Council—a rather necessary quality at times—(laughter)—and his success in other directions showed what a man of such great tenacity of purpose could do and how easily he could deal with situations which others might find very difficult. He had shown also that he had a wonderful bent for work. Presumably that was a legacy of the land from which he came, and from which no Englishman ever returned without being wiser, and lighter. (Laughter.) Mr. Harley had been so impressed by the amount of money that the Scots could obtain from the Englishmen who visited Scotland that he had decided to come right amongst them. In addition to his business capacity, he had few equals on the social side, and he had gone his rounds assiduously. It was perhaps mere coincidence that when he had visited a Branch it happened to be having its annual dinner. (Laughter.) Mrs. Harley had accompanied him on these occasions, and the President added thanks to Mrs. Harley for the very gracious and self-sacrificing way in which she had allowed him to carry on the work of the Institute—(hear, hear)—which owed to them both a debt of sincere gratitude.

MR. F. P. WILSON, J.P. (Past-President), seconding, recalled that Mr. Harley had succeeded him, and added that he had learned of a great many of his own defects and failures by watching Mr. Harley's successes. All members of the Institute realised the great debt they owed to Mr. Harley for his excellent conduct in the chair of the Institute.

The vote of thanks was carried with acclamation, and the Past-President's Medal was presented to Mr. Harley by the President, who expressed the hope that Mr. Harley would live long to enjoy the sentiment it represented.

MR. HARLEY, responding, said he felt that what he had been able to do was very little as compared with what he had intended to do; nevertheless, he hoped his efforts had benefited the industry. He had found the work worth while, because, quite apart from the scientific and technical side of the Institute's activities, he had made many valuable friendships, and that was a source of gratification to him on relinquishing office. He remembered with gratitude how splendidly he had been supported and how friendly and genial everyone had been, not only at Council meetings but also during his visits to the Branches. He thanked the Branches for their kindness not only to himself but also to Mrs. Harley, who had thoroughly enjoyed

* Proceedings, "Institute of British Foundrymen," Volume XXIV, page 151.

those visits. After all, friendship was the most valuable thing in the world, and if he could retain the friendships he had formed within the Institute of British Foundrymen he would always feel that his association with it had been one of the most precious activities of his life.

Senior Vice-President.

The President proposed the election of Mr. C. E. Williams, of Cardiff, who had served as Junior Vice-President during the past year, to the office of Senior Vice-President. Mr. Williams, he said, had considerable interest in everything the Institute did, and had been connected with the Institute since 1906, both indirectly and directly.

Mr. Harley (Past-President), seconding, said he had a great regard for Mr. Williams. When he had had the pleasure of visiting the South Wales Branch at Cardiff, he had found that Mr. Williams' family were held in the highest honour and esteem in the district, and in him the Institute would have a Senior Vice-President who would do it honour.

The resolution was carried unanimously.

Mr. Williams expressed his thanks for the honour conferred upon him. He felt that it would be difficult for him, in due course, to follow the example which he felt sure Mr. Stobie would set as President, but he looked forward to the pleasure of inviting the Institution to visit Cardiff. The members could not have had a better reception than had been accorded them in Newcastle, but he assured them that when they visited Cardiff they would have a very happy time.

Junior Vice-President.

Mr. R. A. Mills proposed the election of Mr. Roy W. Stubbs as Junior Vice-President. He recalled that Mr. Stubbs had served the Lancashire Branch for two years as President, and during that period the membership of the Branch had increased very considerably. The Branch was still the largest in the Institute, and that was due to a great extent to the activities of Mr. Stubbs. He bore a very honoured name, and no doubt he would render to the Institute services which would add lustre to that name.

Mr. Wesley Lambert, C.B.E. (Past-President), seconding, said he had watched the activities of Mr. Roy Stubbs for some years, and felt confident that the Institute would do the right thing if it elected him Junior Vice-President. He was a young man, very genial, with a very happy way of expressing himself, and he had great enthusiasm for the welfare of the Institute. There was another reason why Mr. Lambert was glad to be able to second this proposal. It was due to Mr. Stubbs' late uncle, Mr. Oliver Stubbs, that he personally had served as President of the Institute. There was a time when he had thought he would not be able to accept that high office, but Mr. Oliver Stubbs had told him that he had got to do it, and had assured him of his support. Again, he had the honour of holding the Oliver Stubbs Gold Medal. In Mr. Roy Stubbs the Institute would have a very energetic Vice-President, and one who would do honour to the Institute.

The resolution was carried unanimously.

Mr. Stubbs, after expressing his cordial thanks for the honour, said he regarded it as an honour not so much to him personally as to the Lancashire Branch. The members of that Branch were very grateful, through him.

Auditors.

On the motion of Mr. A. Campion, seconded by Mr. V. C. Faulkner (Past-President), Messrs. J. & A. W. Sully & Company (Chartered Accountants) were re-elected auditors.

Appointment of Trustee.

On the motion of the President, seconded by Mr. F. P. Wilson, J.P. (Past-President), Mr. A. Harley was unanimously elected a Trustee, on the Council's nomination, to fill the vacancy created by the death of Mr. Oliver Stubbs.

Members of Council.

The ballot for the election of five members to fill vacancies on the General Council resulted in the election of the following: Mr. A. Campion (Glasgow), Mr. F. J. Hemming (Walsall), Mr. B. Hird (Newport, Mon), Mr. J. R. Hyde (Newcastle, Staffs) and Mr. J. M. Primrose (Falkirk).

PRESIDENTIAL ADDRESS.

The President then delivered his Presidential Address, as follows:—

The field of thought and of operation of our Institute is a branch of metallurgy practised in a remarkably large variety of industries. The metals used in these different industries vary in character to such extent that what one man must do with his material to increase a certain quality is oft-times the reverse of what the next man should do with his different metal for similar direction of result.

To such an Institute as ours, an ideal Presidential Address should, therefore, be a talk to the sculptor in bronze as well as to the maker of locomotives; to the die-caster as well as to the bell founder; to foundrymen in a hundred different industries, who may be said to cast their daily bread in moulds.

There has been a certain difficulty in finding a topic, common to all these branches of our work, which was suitable for the theme of the present address. I did not wish to survey the year's progress in foundrywork, nor to present a portfolio of statistics, so I have chosen to speak in a style impossible on other occasions. I propose to talk more especially to one section of founding which, in my humble opinion, has a wide-open field in front of it, notwithstanding its past accomplishments. That section is the largest one: it is that of ironfounding. Some remarks will have, nevertheless, more general application.

The wide-open field which I suggest ironfounding has in front of it is the adoption by that industry, as a whole, of a more exhaustive scientific investigation of their metal. At present, what investigation work is being done is left to the few.

A common thought leads one sometimes to imagine—vainly, it is true—that one's own occupation in life calls for more care than those of others. Thus I allow myself, for the purpose of this talk, to tell the ironfounder what a steelman, who has had a bird's-eye view of some ironfoundries, thinks he would do in their circumstances! To avoid putting my foot in a hornets' nest, I take refuge behind a further suggestion: this talk is to those who agree with me!

Cast iron is different from most other metals in that it can only be used in the form of a casting, for which obvious reason the ironfounder does not have to compete, as do the brassfounder and the steelfounder, with a competitor producing a more or less similar material in the wrought form. This lack of a competitor has not helped the ironfounder to put forward his greatest efforts. I want to suggest to the ironfounding industry a mental picture of such a competitor, and to ask it to act as it would have to do were such an ogre trying to steal away its order-book.

A New Industry?

If this conjectural wrought-cast-iron industry existed, its practitioners would have had to ascertain—if other wrought-metal industries are a guide—the infinity of variations of which its metal was capable. It would have found which composition gave the best resistance to rupture by tension and shock; which the greatest elasticity; the highest resilience; the least permanent deformation by heat or other stress; the variations of characteristics by heat-treatment; the greatest toughness for a given machinability. These and other essential inquiries would have had to be made by our hypothetic wrought-cast-iron practitioner, and he would have become a redoubtable competitor to the ironfounder who had not equally equipped himself with all such fundamental knowledge of his metal.

There are still ironfounders—shall I say: outside this Institute?—who are prone to regard their castings as the result of So-and-so's pig-iron and such-and-such scrap, plus a black-sand mould. If a casting does not turn out satisfactorily, So-and-so's pig-iron is suspected of having "gone to the dogs," or such-and-such scrap is "not what it used to be." It is necessary, to-day, that the ironfounder should know that his metal is no longer a mystery. This does not imply that all, or anywhere near all, is known about it; but sufficient can be ascertained to explain the vast majority of happenings, good and bad, in a foundry. It is within the reach of all ironfoundrymen to have a fair understanding of the basic principles of the metallurgy of cast iron by an extent of study well in proportion with the resulting advantages.

A Chemist not Necessarily a Metallurgist.

To a foundryman who desires to acquire as quickly as possible a working understanding of ferrous metals, I would recommend the study of physics even more than chemistry, for the principles governing successful metal-production and founding involve more varying physics than varying chemistry. A chemist is not necessarily a metallurgist, even though he may have spent a long time in a metallurgical laboratory and be highly skilled in the analysing of metals. Such skill is of little help in solving the major problems which occur in the foundry.

The metallurgist's principal section of chemistry is what, for the sake of distinction, I will call "thermal chemistry." The chemistry of the laboratory is "cold chemistry." Thermal chemistry may be studied by, first, acquiring a knowledge of the technics of combustion. If the student has only time to devote himself to a single study—though I cannot possibly commend such limitation—the acquiring of a thorough knowledge of the physics and chemistry of combustion will be the most remunerative study he can make. With such knowledge in hand he will appreciate, more than he might have thought possible, a considerable number of happenings in the day's work.

Pioneer Work.

The way to a systematised study of cast iron was shown, as far back as 1885, by Emeritus Prof. T. Turner, of Birmingham University, an esteemed Oliver Stubbs Medallist of our Institute. He made a comprehensive series of pure cast irons to which he added increasing percentages of silicon. His researches, showed, for the first time, the effects of varying that most important element. One could have hoped that such a fruitful investigation would have encouraged ironfounders to further the quest for all similar basic information. We know that private interests have pursued certain directions of work; in some cases with great recompense to themselves. We do know also—and this is the pith of my message to the ironfounding industry—that thorough research has been done in all the usual elements in the case of all other industrial metals.

If the grey-iron foundry industry possessed reasonably tabulated figures showing, for iron made under given conditions, the effect of a variation in the percentage of each of its normal constituents and, additionally, on the lines so excellently started by our esteemed member, Mr. J. E. Hurst, the effect of varying heat-treatments on those irons, we could picture an industry still more potent to help the engineer and, through him, the world.

Fields for Research.

Considerable essential investigation has yet to be done on the influence of blast-furnace and cupola operation on the ultimate quality of cast iron of given composition. One may have used at different times, as raw material for castings,

pig-iron of approximately similar composition procured from two sources at a distance apart, or one may have used similar composition iron made at two different periods in the same blast furnace. Why can the resulting castings from each lot of pig-iron have different properties when the composition is similar? I am assuming moulding conditions to be constant. Are such occurrences imaginary? If not, do they result from differences in the raw materials of the blast furnaces; in the operation of those furnaces; or in the cupola practice? And can a uniform product be ensured at all times by skilful foundry control notwithstanding any previous history of the iron, so long as its composition is correct?

If I dared to answer my own questions, I should probably be found answering the last one in the affirmative. As I have the advantage of your not discussing this address, I will not pursue this arguable view at greater length than to ask you to picture what it really portends if a skilful metallurgist has, with to-day's knowledge and facilities and with technical dicipline in the foundry, the wherewithall invariably, or almost invariably, to produce good-casting metal notwithstanding inconsistency of quality in his raw material.

Text-Book Fallacies.

As my efforts in this talk are centred on encouraging the everyday ironfounder to take a greater scientific interest in his wonderfully versatile metal, I feel I ought to give, at the same time, a very unusual type of warning. Whilst the ironfounder is pursuing his technical studies, it is advisable for him, when experimenting in new directions, not to be unduly controlled by supposed axioms from text-books on metallurgy if they do not coincide with the results of well-conducted experiments he has made. It happens, not alone in isolated cases, that statements based on little evidence, or even unsupported expectation, are copied from text-book to text-book until they assume the aspect of accepted facts. A glaring example kept cast-iron metallurgists, until recently, from serious study of the heat-treatment of cast iron. The text-books wrongly said, in perfect unison, that no sufficient advantage resulted. Dr. Percy, in his famous book on metallurgy, said no steel would ever displace iron for the armour of warships! Another example, this time referring to refractories, came to my knowledge some years ago. A well-known Welsh steelworks installed a mixer furnace to hold some 200 tons of molten blast-furnace metal. It was lined with magnesite bricks. The designer of the plant, who had had no previous experience of basic linings, primed himself with all he could gleam about magnesite bricks from the best text-books on refractories. Shortly after the mixer had been put into commission, one of its ends burst open. A seething mass of molten metal poured out into the melting shop. I chanced to meet the designer the day he heard of the disaster. He said nothing about it until after ascertaining my experience as to whether such bricks expanded or not on heating. The reply was, of course, in the affirmative. He then told the story of how he had based himself with confidence on the text-books, all of which said those bricks neither expanded nor contracted on heating. To-day, the text-books still say the same.

Dangers of Exterpolation.

A parting suggestion to the intending investigator is to learn early that a metallurgist should never attempt mathematical deductions from his discoveries. He must not conclude, for example, that because a 1 per cent. manganese steel is tough and a 15 per cent. one tougher still, a 5 per cent. one will be of intermediate toughness. Nor must he tell himself that because iron is made non-magnetic by an addition of some 30 per cent. of nickel, it follows that greater additions cannot make it again magnetic. He must not deduce that because wrought iron increases in electrical and thermal resistivity as it approaches its melting point, cast iron does the same. Such presumptions would lead his metallurgy to disaster.

I have spread my remarks over a broad series of points in order to express to the ambitious ironfoundryman that it is essential for him, just as for every other metallurgist, to plump for the knowledge which waits on nearly every bit of thoughtful experimental work he is prepared to undertake.

We receive encouragement, from every direction, to free ourselves in metallurgical matters from the rut of unenlightenment, and to strive forward with the adventurous mind of the explorer bent on making useful discoveries in a promising land. If we observe that all-essential practice of keen observation, and arm ourselves with a working knowledge of the sciences, we are almost certain to discover something new and valuable before our labour is ended. It is rare for such a journey to be taken in vain.

Vote of Thanks to the President.

MR. A. HARLEY (Immediate Past-President) proposed a hearty vote of thanks to the President, and congratulated him upon the original matter contained in the address; it had been very suggestive, and would be studied carefully by all concerned, for their own benefit. In industry to-day the technical and scientific investigator and the technical man who was responsible for the routine work should be held in much higher regard than they were, and should not be at the mercy of the waves and winds of industrial ups and downs. How could such work be carried out properly under the conditions existing in so many places to-day? Such work was exceedingly difficult; sometimes those in control of industry did not even understand it, and consequently did not appreciate its true value, except, perhaps, when the results emerged. Industry was being carried on the shoulders of these scientific and technical men, and it was not the financial consideration which kept industry going, although many people considered that it was. Without the scientific and technical men, industry would die. That was why the Institute should always insist upon the high status of the work these individuals were responsible for, and for which the Institute was the bulwark and spokesman. The President's address was admirable.

MR. J. SMITH (President, National Iron Founding Employers' Federation), seconding, said the address was such as he had expected from Mr. Stobie. Whereas the technical side of the industry might be highly appreciated at the present time, perhaps we were a little apt to forget the practical side, and we must never forget that there were moulders as well as metallurgists and chemists. Many years ago, good practical Papers were presented at these conferences, but nowadays the Papers seemed to be scientific from top to bottom. It was of no use making high-class material and putting it into bad moulds. He had enjoyed the Presidential Address thoroughly.

MR. HARLEY, submitting the vote of thanks to the meeting, pointed out that he regarded the moulder as a technical man, and he appealed that the imaginary fences between one class of worker and another should be knocked down.

The vote of thanks was carried with acclamation.

The PRESIDENT, commenting on Mr. Harley's remark that scientific and technical men should not be at the mercy of the ups and downs of industry, asked how it was possible to avoid that, because the result of the "downs" was that certain works closed and the poor metallurgists had to go. As to the line of demarcation suggested by Mr. Smith between different workers, he was glad to hear Mr. Harley point out that they were really more imaginary than real. If the practical moulder did not count himself a technician, then what was a technician? If he were practical he was dealing with the technics.

The reading and discussion of Papers was then proceeded with.

The members lunched together at the County Hall, Neville Street, Newcastle, and in the afternoon visited various works in the Tyneside area.

Import Duties on Iron and Steel.

ADDITIONAL PROTECTION FOR PIG-IRON.

The Treasury has to-day issued two Orders, on the recommendation of the Import Duties Advisory Committee. They are the Import Duties (Exemptions) (No. 1) Order, 1932, and the Additional Import Duties (No. 2) Order, 1932, each of which will take effect as from midnight, Monday, June 13.

Since the issue of the Additional Import Duties (No. 1) Order, 1932, which provided for a duty of 33⅓ per cent. on a number of semi-finished iron and steel products, to operate for a limited period pending proposals of a more permanent character, the Advisory Committee have received representations from various quarters in regard to the scope of this temporary duty, and on a review of all the circumstances—particularly the fact that in some respects the economic conditions have changed since the recommendations were framed—the Committee have come to the conclusion that certain alterations in the detailed list of products covered by the 33⅓ per cent. duty appear to be necessary. Of these, the most important is the addition to the list of pig-iron (other than pig-iron smelted with charcoal).

In recent weeks quotations of Continental pig-iron have fallen to such an extent as to constitute in present circumstances a grave menace to the continuance of home production in certain areas even at the present low level, and the Committee are satisfied that with this threat of foreign undercutting, the risk of blast-furnaces in these areas closing down is sufficiently definite to warrant the extension of the temporary duty to pig-iron. In making this recommendation, the Committee are fully alive to the danger of adverse reactions on some sections of the iron and steel industry. With possibilities of future variations in the price of raw materials and with the very different trading results of individual firms, it would be unreasonable to expect any general guarantee from the industry that prices will in no circumstances be increased during the period of the temporary duty, but the Committee propose to watch the position and they will not hesitate to recommend the immediate removal of the additional duty, should it appear to them to be operating unfairly against the users of pig-iron.

A second addition to the list of articles liable to the temporary 33⅓ per cent. duty is that of castings weighing less than 1 cwt. The existing heading limits the temporary duty to castings weighing 1 cwt. or over. The Committee adopted this weight limit in their original recommendation so as to exclude from the operation of the additional duty the standard iron castings used in domestic building. They were sensible of the fact, however, that by fixing the limit so high they are withholding protection from numerous types of smaller castings which it was desirable to protect. These types, which are mainly of steel manufacture, amount to more than one-half of the total imports of castings, and the reduction of these imports should give a very much needed stimulus to the home manufacture. The Committee have now come to the conclusion that a better course than that contained in their original proposal would be to except by specific enumeration the particular articles which it is desired to exclude from the scope of the duty, and to lower the weight limit to 7 lbs. so as to bring in the much larger class of castings which stand in need of protection. The articles exempted are gutters, domestic tanks and cisterns. The Committee further propose to recommend that stampings and pressings should be brought under the same heading, so that the appropriate reference in the original order now reads:

"Castings, stampings and pressings, in the rough or machined, weighing 7 lbs. or over, other than gutters, domestic tanks and cisterns."

(*Concluded on page* 373.)

British Non-Ferrous Metals Research Association.

The twelfth annual report, for the year ended December 31, 1931, shows that the Association is continuing to make excellent progress. The following is a résumé of the portion of interest to non-ferrous foundrymen.

The year 1931 introduced a new era in the life of the Association, marked by the establishment of its headquarters in London. The official opening by the Rt. Hon. Lord Rutherford, O.M., F.R.S., took place in June, by which time the installation of equipment and transfer of the Office, Library and Development Sections, and Central Laboratory were nearing completion. The effect of centralisation has far surpassed expectations, and represents a great step forward in the potential service of the Association to its members. All those who have so far visited our laboratories, development exhibition and library, have expressed surprise and appreciation at the tangible evidence of the growth and activity of the Association. Unfortunately, there are still a few members who have not even yet made an opportunity to pay such a visit.

Headquarters Fund and Expenditure.

The anticipation of improved service to members by having the staff working together under one roof has been fully realised. The close liaison between the research laboratory, development section and the library has greatly facilitated the work of the whole staff of the Association. It is gratifying to record that the industrial subscriptions have slightly exceeded those of any previous year. The original scheme for centralisation planned to raise a Headquarters Fund of £30,000. Owing to the financial crisis, it soon became obvious that for the present a much more modest undertaking was all that could be provided. The total of special contributions to the Headquarters Fund during the past two years has amounted to only £4,730. Having secured, on lease, a well-situated property near Euston, a great part of the prospective capital cost was for the time being avoided. The removal and equipment expenses so far incurred have amounted to about £8,000, the balance being met temporarily from the Association's reserve. It is hoped that, when better times return, funds will be available for supplementing the equipment and providing the Association with a more worthy home.

The Research Department.—The extra-mural researches at the National Physical Laboratory Research Department, Woolwich, and the Birmingham University have been continued, but with the provision of headquarters a considerable amount of research is now in progress in the Association's own laboratories. The total research staff engaged on the Association's work is about thirty-five, of whom sixteen are now employed at headquarters. On January 1, 1931, Dr. D. H. Ingall took up his post as Assistant Director, and has acted as Administrative Officer of the Research Section with Dr. O. F. Hudson as Senior Metallurgist.

Development Department.—In accordance with the policy of extending this branch of our work, the staff of this section has been increased by the appointment of Mr. A. Brandt, B.Sc., A.I.C., and Mr. A. E. G. Liddiard, B.A., and a total staff of six is now employed under Mr. G. L. Bailey, M.Sc., the Chief Development Officer. The objective of this section is to utilise every possible method for bringing the results of research more fully to the service of members. A permanent exhibition to illustrate some of the practical results of the Association's work has been organised during the year, and is proving of great interest and value.

Library and Information Department.—Here again marked progress has been achieved during the year. The library now contains over 10,000 books and pamphlets. The "Bulletin," previously a quarterly issue, has appeared since April, 1931, at regular monthly intervals. Miss J. Lawson, B.A., has been appointed Assistant Librarian, and Mr. B. Fullman, B.Sc., A.I.C., as Editorial Assistant, has risen splendidly to the increased demands made by the extension of the work on the "Bulletin" and translations, etc. Further assistance is urgently required in this Information Section, the growing calls on which are most encouraging.

D.S.I.R. Grant.

The Association has again succeeded in earning the maximum possible grant of £8,000 for the past year from the Department of Scientific and Industrial Research, and this, with the subscriptions of members and other special contributions, brings our total income up to £25,132 17s. 8d., which is slightly in excess of any previous record.

It must be recognised that this total includes non-recurring contributions to the Headquarters Fund and that the full effect of the economic depression has not yet been felt, so that a great effort will be needed to attain and surpass this achievement in 1932.

In October a communication from the Department of Scientific and Industrial Research gave notice of a more strict interpretation of grant-earning income and drew attention to the review of the Association's conditions of grant which will take place during the coming year. Following up the D.S.I.R. request for a study of possible economies, a careful scrutiny of the Association's expenditure has been made and wherever possible economies have been effected and steps taken to assure greater efficiency. In view of the splendid efforts which the members have made to build up the Association's organisation, it is earnestly hoped that they will do their utmost to maintain its present strength and facilitate its further progress.

Membership.—The enrolment of a large number of members from the lead-manufacturing industry represents a marked accession to the support of the Association and was heartily welcomed by the Council as bringing the Association in touch with a field hitherto almost unrepresented. Several other new members have been enrolled during the year, although the number is not as large as usual. On the other hand, there has been an abnormal number of resignations. The Association has suffered particularly from the withdrawal (it is hoped only temporarily) of financial support from the tin industry, due to the formation of the International Tin Research Scheme.

Special Subscriptions.—The Association receives great encouragement from the support afforded by a number of prominent institutions in recognition of its work. The Worshipful Company of Armourers and Braziers has continued its grant; the British Electrical and Allied Industries Research Association has contributed to the researches on the corrosion of condenser tubes, as has also the Brass and Copper Tube Association. The new investigation on the frost bursting of water pipes has attracted the interest and support of the British Waterworks Association, the Water Companies' Association, and the Royal Institute of British Architects. Mention should also be made of the grant from the Tin Producers' Association which during the year enabled the new tin investigations to be continued.

Future Outlook.

(*a*) *Support.*—The Association is faced with a very difficult task at the present time in maintaining its subscription income. Industrial conditions make it increasingly difficult to assure the present industrial contributions, many of which will depend on output. The extension of the Association's headquarters and the attractive list of new investigations which require financial support call not only for the maintenance of the present income but for a great increase in our resources. There are, of course, still some sections of the industry which should be prepared to follow the lead of the pioneers by joining the Association, and now that there are tangible proofs of the successful results of its efforts every endeavour should be made to increase the membership. The whole field of the users of non-ferrous materials still holds aloof, despite the fact that in many directions they have already received great financial benefit from improved materials originating in this Association's researches. Mention has also been made of the foundry industry, for which several of the researches offer hopeful prospects of benefit.

(*b*) *Research Programme.*—It is generally agreed that industry is in urgent need of new directions for advance and that both new materials and increased efficiency will come to those who are most active in research enterprise. The Association during the year has surveyed a wide field and formulated suggestions for research vastly beyond its present resources. This work calls for urgent consideration and full support. Some of the Association's most successful results have followed from a systematic examination of industrial practice. Cannot much more be done in this direction? A small team of chosen researchers, with access to a group of works, concentrating their attention on some specific manufacturing processes, could, without doubt, bring to light many possibilities of large economies and new lines of progress.

(*c*) *Development.*—Here the new steps taken by the Association and the increased staff available afford a hopeful outlook. The next step lies with the individual member, who must make sure that he is playing his proper part in exercising an active rather than a passive attitude towards the Association.

(*d*) *Information.*—The Association possesses a unique service in the combination of its library and technical officers. This service is fully paying its way, having now clearly established a demand from large numbers of our members who in the early days were quite apathetic as to the value of this section of our work.

The present position calls for an immediate extension. The Association affords an excellent survey and prompt reports on all new work published throughout the world. There is, however, still no adequate provision for a ready reference, cumulative and classified index, the need of which increases rapidly year by year. One or two extra assistants and a relatively small subsidy would provide the Association with an Information Bureau vastly strengthened to afford service to members. To stop where we are now is most wasteful, when just a little more will keep us permanently in touch with the data so laboriously collected.

Progress of Research Work.

During the early part of the year every effort was made to provide the necessary equipment at Regnart Buildings for the progressive continuation of the work as the researches were transferred, and for a minimum of interruption in each case while the move was taking place. The latter part of the year has been devoted to the consolidation of the existing work in London and the planning of further work to be undertaken. A new research has been started under the direction of the Atmospheric Corrosion Sub-Committee to compare the tarnishing and corrosion of different metals and alloys used for decorative and architectural purposes when exposed in a brightly polished condition.

Another new investigation is an extension of the research on "Aluminium Castings," with the object of ascertaining the possible effect of very small quantities of impurities in aluminium upon the soundness of the cast material.

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Reorganisation of the Iron and Steel Industry.

NATIONAL COMMITTEE CONSTITUTED.

A national committee to work out schemes of reorganisation in the iron and steel industry has been set up following a meeting which a large number of representative iron and steel producers had with the Import Duties Advisory Committee on Friday, June 3. The meeting was held at the invitation of the Advisory Committee. The Chairman of the Committee (Sir George May) presided, and there were also present Sir Sydney Chapman, Sir Allan Powell, Mr. Percy Ashley (secretary), Sir Alfred Hurst, Mr. H. J. Hutchinson (assistant secretary) and Mr. Loughnane.

In his opening statement Sir George May read the following passage from the First Report of the Import Duties Advisory Committee: "We are satisfied that the maintenance of a prosperous iron and steel industry in the highest degree of efficiency is essential to the economic progress of this country, while from the point of view of national security it must still be regarded as vital. We accept therefore the preliminary proposition that this industry shall be adequately protected, and protected at once."

Brighter Prospects.

Sir George May said that statement had been made deliberately, with a full recognition of its import, and the further consideration which the Committee had given to the position of the industry had only confirmed them in the opinion therein expressed. The Committee recognised fully the difficulties and discouragement in which the industry had been working in recent years. Without a tariff or Government assistance of some description there had been every reason for pessimism as to the future of the industry. A new position had now been created and the prospects of the industry were very much brighter. But a tariff would not automatically solve all the problems with which those engaged in the industry were confronted. The industry could not be prosperous unless it could sell its products, and it could only sell its products if the industries using them were flourishing. Those industries were very largely export industries, and could only maintain and develop their exports if they could be assured of getting from the iron and steel industry the requisite material of the right quality and at the lowest possible price. The main value of a tariff, therefore, would be to afford the industry the opportunity of putting itself in order on the lines best adapted to this country and the diversified nature of the demands which had to be met; the methods of organisation adopted in other countries were not necessarily appropriate in our own case.

A determined and united effort, in which personal considerations would have to be put aside, was essential. Few of the critics of the industry realised what great steps the industry had made, and was making, in this regard under very difficult conditions resulting from the intensity of the competition which it had been experiencing, but admittedly a great deal still remained to be done, and the conditions for reorganisation were now much more favourable. The work of reorganisation could not be completed at a stroke; it would be a process of evolution, but the Committee was convinced that the main lines of this evolution must be laid down and the all-important first steps must be taken concurrently with the granting of adequate protection in the home market. They must, in fact, be a condition of such protection.

Industry to Devise its Own Remedies.

The Committee had no desire to dictate to the industry what the general lines of evolution should be; the industry itself must work out its own plans, but the Committee would not hesitate to criticise those plans in respect of their adequacy to meet the emergency with which the country's trade was faced. The Committee had therefore decided to constitute a national committee to work out appropriate schemes with district sub-committees and a small executive committee. There would also be certain small committees for specialised sections of the industry. It was essential that each section should review the branch of the industry falling within its purview, not only from the point of view of meeting foreign competition with its products in this country, with the aid of a reasonable measure of protection, but also with the definite object in view of supplying British users of iron and steel at a price and quality that would enable them, in turn, to sell their products in the markets of the world.

Sir George May requested Mr. Charles Mitchell (chairman and managing director of Messrs. Dorman, Long & Company, Limited) to accept the chairmanship of the National Committee, and Mr. Mitchell accepted the invitation. Sir William Larke, Director of the National Federation of Iron and Steel Manufacturers, was asked, and consented, to act as secretary to the National Committee, with Mr. M. S. Birkett, of that Federation, as assistant secretary.

Sir George May further said that in recommending an additional temporary duty of 23⅓ per cent., making 33⅓ per cent. in all, on certain classes of heavy iron and steel products for a period of three months as an emergency measure the Committee had indicated that, if its inquiries had not been concluded and a more permanent scheme framed within that period, it would propose to recommend some extension. The Committee wished to make it quite clear that should the present abnormal competition continue it would not hesitate to recommend a continuance of the present emergency duties

MR. CHARLES MITCHELL

(Chairman of the National Committee of Reorganisation for the Iron and Steel Industry).

for as long as they might prove to be necessary, and the industry could be assured that, provided it did its part, the permanent tariff to be recommended would be sufficient to achieve the object in view.

Sir William Larke, Mr. A. J. Grant (President of the National Federation of Iron and Steel Manufacturers) and Mr. Charles Mitchell expressed, on behalf of the meeting, cordial appreciation of the action which the Import Duties Advisory Committee had already taken in respect of the iron and steel industry, and of the important pronouncement which had been made by the chairman as to the future policy of the Committee. They assured the Committee of the whole-hearted response of the interests which they represented to the chairman's call for a national effort.

Personnel of National Committee.

The National Committee held its first meeting in London on June 7, under the chairmanship of Mr. Charles Mitchell. It appointed from among its members four Regional Committees representing Scotland, the North East Coast, the Midlands, and South Wales, respectively. An Executive Committee was also appointed, the members of which are to be the chairman of each of the Regional Committees, with one additional member from each district, except the Midlands, which, owing to its size, will have two additional members, making an Executive Committee of nine in all. The Regional Committees have power, if necessary, to add to their numbers to ensure that they are representative of the whole of the interests of their district.

Below is a list of the members of the National Committee as at present constituted:—

Mr. Charles Mitchell (chairman, Dorman, Long & Company, Limited), chairman.

Mr. E. J. George (managing director, Consett Iron Company, Limited).

Mr. A. N. McQuistan (managing director, Cargo Fleet Iron Company, Limited, and South Durham Steel & Iron Company, Limited).

Mr. John Craig (chairman, Colvilles, Limited).

Mr. A. K. McCosh (chairman, Wm. Baird & Company, Limited).

Mr. Walter Gray (managing director, Steel Company of Scotland, Limited).

Mr. Andrew Gray (general manager Lanarkshire Steel Company, Limited).

Sir John Beale (chairman, Guest, Keen & Nettlefolds, Limited, and British (Guest Keen Baldwins) Iron & Steel Company, Limited).

Sir W. J. Firth (chairman, Richard Thomas & Company, Limited).

Mr. Frank Rees (chairman, South Wales Siemens Steel Association; managing director, Llanelly Steel Company, Limited).

Capt. R. S. Hilton (managing director, United Steel Companies, Limited).

Mr. F. Clements (general manager, Park Gate Iron & Steel Company, Limited).

Mr. H. A. Davies (general manager, Patent Shaft & Axletree Company, Limited).

Mr. J. E. James (chairman, Lancashire Steel Corporation, Limited).

Mr. H. Summers (chairman, John Summers & Sons, Limited).

Mr. A. C. MacDiarmid (chairman, Stewarts & Lloyds, Limited).

Mr. E. J. Fox (managing director, Stanton Ironworks Company, Limited).

Mr. G. H. Johnson (managing director, Kettering Iron & Coal Company, Limited).

Mr. D. N. Turner (managing director, Staveley Coal & Iron Company, Limited).

Mr. W. R. Lysaght (chairman, J. Lysaght, Limited).

Major A. Hibbert (general manager, Millom & Askam Hematite Iron Company, Limited).

Mr. J. Davison (general manager, Barrow Hematite Steel Company, Limited).

Mr. A. J. Grant (President, National Federation of Iron and Steel Manufacturers; managing director, Thos. Firth & John Brown, Limited).

The secretary of the National Committee is Sir W. J. Larke, director of the National Federation of Iron and Steel Manufacturers; Mr. M. S. Birkett, secretary of the National Federation of Iron and Steel Manufacturers, is assistant secretary.

British Non-Ferrous Metals Research Association.

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Some progress has been made in preparation for the commencement of investigations on the soundness of castings and on other problems connected with the casting properties of metals. So far the Association has, apart from die casting and aluminium casting, had little contact with the foundry industry. It is thought that much of the past work on die castings, gas inclusions and porosity, can afford service to other sections of the industry, particularly if the Association can equip itself to apply and extend these investigations to a study of typical non-ferrous foundry products.

Import Duties on Iron and Steel.

(Concluded from page 371.)

Other alterations in the list are the addition of spring steel which will accordingly be liable to duty at 33⅓ per cent. instead of 10 per cent., and the removal from the list of: (*a*) Wrought-iron bars produced by puddling with charcoal from pig-iron smelted wholly with charcoal, and (*b*) rolled strip over 10 in. wide in coils weighing more than 3 cwts. In the case of these items the duty liable will hereafter be 10 per cent. instead of 33⅓ per cent.

The Committee has now submitted to the Treasury a first list of articles in regard to which they are satisfied that the two conditions laid down by the Act are fulfilled; these include crude emery and mercury.

This Week's News in Brief.

Trade Talk.

THE WHITEHEAD IRON & STEEL COMPANY, LIMITED, Newport, has received a contract for 10,000 tons of strip for the Soviet Government.

APPLICATION to register the trade mark "Alcro" (firebricks) has been made by Messrs. John G. Stein & Company, Limited, of Bonnybridge.

IT IS UNDERSTOOD that a new company is being formed with a view to acquiring and carrying on the business of Messrs. Davey, Paxman & Company, Limited, engineers, of Colchester.

THE CLEVELAND STEEL CASEMENT COMPANY, LIMITED, 96, Commercial Street, Middlesbrough, a new company promoted by the management of the Middlesbrough Ship Repairing Company, Limited, commenced production this week.

THE BURNTISLAND SHIPBUILDING COMPANY, LIMITED, has received an order from the Wandsworth & District Gas Company for a new steamer of 2,000 tons deadweight, for carrying coal to the Wandsworth Gasworks above bridges on the Thames.

THE PARTNERSHIP between Messrs. Ernest Oakley and James Oakley, carrying on the business of ironfounders, etc., at Overend Cradley, Worcester, under the style of Oakley Bros., has been dissolved. Mr. James Oakley is continuing the business under the same style.

SIR W. J. FIRTH, the chairman of Messrs. Richard Thomas & Company, Limited, and Sir Edgar Jones, who is chairman of the National Canning Council, are going to Ottawa to represent the tinplate industry in connection with the general steel delegation of the United Kingdom.

ELECTRICAL MACHINERY weighing 340 tons was despatched recently from the works of Messrs. C. A. Parsons & Company, Limited, Newcastle-upon-Tyne, to Copenhagen. The machinery includes two 36,000-kw. turbo-alternators for the Copenhagen municipality lighting department.

MESSRS. DORMAN, LONG & COMPANY, LIMITED, in conjunction with other engineering firms, are preparing a scheme to provide railways, bridges and power plants in China on an extensive scale. A company called Dorman, Long & Associates (China), Limited, has been formed, the firms associated with Dorman, Long being the Metropolitan-Vickers Electrical Company, Limited, Babcock & Wilcox, Limited, Callender's Cable & Construction Company, Limited, Beyer, Peacock & Company, Limited, the Tilbury Contracting & Dredging Company, Limited, J. I. Thornycroft & Company, Limited, and Edgar Allen & Company, Limited.

MEMBERS OF THE National Union of Foundry Workers have ceased work at Messrs. G. & J. Weir's Holm Foundry, Cathcart, because of the alleged employment of non-members at wages and conditions which have not been negotiated by the Union. The firm recently closed the Argus Foundry at Thornliebank and transferred the work to Cathcart. The Union complains that the action of the firm is a breach of the national agreement between the National Engineering Employers' Federation and the engineering trade unions. The dispute involves only about 20 men, but the attitude of the Union is that none of their members can enter the employment at Holm Foundry until the dispute is settled. This is the first strike that has occurred at Cathcart for over 50 years.

THE MOND NICKEL COMPANY, LIMITED, in an announcement concerning the temporary closing of the Clydach (Swansea) refinery, states that experiments have been carried out over an extended period with the object of improving the calcination process as carried out at these works. In September last year an experimental calciner of a new type was put into operation and as a result of the experience gained it has now been decided to instal a battery of six similar calciners and to couple these up to the new grinding plant recently installed. This decision will entail the outlay of a considerable amount of money, and as the erection of the new plant will interfere considerably with the normal running of the works it has been decided to suspend operations for some weeks and so enable the new construction to be proceeded with without interruption.

Personal.

MR. L. 1. G. LEVESON has been appointed a special director of Messrs. Vickers-Armstrongs, Limited.

MR. J. R. M. WILSON, chairman and managing director of Messrs. Stewarts & Lloyds of South Africa, Limited, has been appointed a director of Messrs. Stewarts & Lloyds, Limited.

MR. F. PAUL LIST, late general works manager of the Barrow Hematite Steel Company, Limited, and the Millom & Askam Hematite Iron Company, Limited, has gone to reside at 2, Rue Michel Lentz, Luxemburg.

MR. ROBERT LUDWIG MOND, President of the Faraday Society, who has received a knighthood, is a director of the International Nickel Company of Canada, Limited, the Mond Staffordshire Refining Company, Limited, and the South Staffordshire Mond Gas Company. He has carried out much research work in pure and applied chemistry and electro-chemistry. He is a member of the Iron and Steel Institute and of the Council of the Association of Scientific and Technical Institutions.

Wills.

DUGARD, G. H., managing director of Messrs. Dugard Bros., Limited, metal rollers, of Birmingham £20,311

BRITTEN, THOMAS, chairman and managing director of the Hydraulic Engineering Company, Limited, Chester, and of the Suffolk Iron Foundry (1920), Limited £14,764

Company Reports.

Chemical & Metallurgical Corporation, Limited.—Profit for 1931, before charging depreciation, of £8,831.

Crompton Parkinson, Limited.—Interim dividend of 10 per cent. on the ordinary and "A" ordinary shares.

Mirrlees, Bickerton & Day, Limited.—Dividend of 2½ per cent. on the ordinary shares for the year ended March 31 last.

Allied Ironfounders, Limited.—The directors recommend payment of the dividend on the 7 per cent. cumulative preference shares for the year to March 31, 1932, but do not recommend any dividend on the ordinary shares.

Whessoe Foundry & Engineering Company, Limited.—Profit, including interest, profit on investments realised, and transfer from reserves no longer required, £17,069; brought in, £9,035; depreciation, £5,251; staff welfare and provident schemes, £1,015; dividend of 7½ per cent., less tax; carried forward, £6,304.

Callender's Cable & Construction Company, Limited.—Gross profit, £528,883; brought in, £291,793; general expenses, £169,976; provision for pensions, £15,647; repairs and maintenance, £32,593; depreciation, £37,500; debenture interest, £13,500; preference dividends, £56,000; ordinary dividend of 15 per cent.; carried forward, £292,054.

Contracts Open.

Lahore, July 6.—200 tons of anti-friction metal, for the North-Western Railway of India. The Department of Overseas Trade. (Reference G.X. 11,530.)

London, S.E., June 21.—80,000 jaws for fastening rails to metal sleepers, for the Director-General, India Store Department, Belvedere Road, Lambeth, London, S.E.1. (Fee 5s., non-returnable.)

Portugal.—Six weighbridges, 40 metric tons capacity, for the Compagnie des Chemins de Fer Portugais. The Department of Overseas Trade. (Reference G.X. 11,524.)

Sydney, N.S.W., June 20.—Electrically-driven pumping plant, for the Department of Public Works, New South Wales. The Department of Overseas Trade. (Reference G.X. 11,522.)

Obituary.

THE DEATH OCCURRED suddenly in Glasgow, on June 10, of Mr. Robert Forsyth, who for many years was employed with Messrs. Douglas & Grant, founders and engineers, Kirkcaldy, and later with the Anderston Foundry Company, Glasgow.

MR. WILLIAM GRAY, who was connected with the firm of John Abbott & Company, ironfounders, Gateshead, until the firm closed down, has died at Heaton, Newcastle-upon-Tyne, at the age of 85. He was latterly associated with Messrs. Boulton & Paul, Limited, of Norwich, and the Hull Forge Iron & Steel Company, Limited.

A TRAGIC AFFAIR took place at the Carron Company's Mungal Foundry, Falkirk, on June 6. William Inglis M'Lachlan, a machine moulder, was discovered kneeling in front of a water bosh with his head and shoulders submerged beneath the surface of the water. Medical aid was summoned, but life was found to be extinct. M'Lachlan had gone to draw water when he had a sudden seizure and fell forward into the water.

MR. WILLIAM STEEL, J.P., of Saling Grove, Essex, has died at Droitwich. Mr. Steel, who was 67 years of age, was formerly well known in Sheffield business circles. He was connected with the business of Messrs. Steel, Peech & Tozer during the greater part of his life. When the United Steel Companies, Limited, was formed, by the amalgamation of Steel, Peech & Tozer and other firms, he became one of the original directors, and he remained a member on the board until his retirement, some ten or twelve years ago.

WE REGRET TO ANNOUNCE the death of Mr. T. Scott Anderson, of Endcliffe House, Bakewell, Derbyshire. An ex-member of the Indian Civil Service, which he joined at the age of 18, and was engaged upon cable laying in the Indian Gulf. For his services he received a gold medal from the Indian Government, a signet ring from the Shah of Persia, honorary membership of the French Institute of Civil Engineers. For some time he was a district engineer to the Telephone Company, and later spent some four years with Crompton & Company, of Chelmsford, for experience in the heavier type of electrical engineering. In 1892 he established himself in business in Sheffield as a consulting engineer. One of his daughters is extremely well known in foundry circles as the wife of Mr. H. F. Coggon, managing director of August's Muffle Furnaces, Limited, of Halifax.

SIR DORABJI JAMSETJI TATA, head of the Tata Companies, of India, chairman of the Tata Iron & Steel Company, Limited, died on Friday, June 3, at the age of 72. He was the founder of the great iron and steel works at Jamshedpur, which he started after his own prospecting work had discovered the rich deposits of iron in Orissa. The production of steel at Jamshedpur during the Great War was of great value to Britain. Sir Dorabji, who was knighted in 1910, had large interests outside the iron and steel industry. The hydro-electric installations on the Western Ghauts were the result of his initiative and enterprise. He established and endowed the Institute of Science at Bangalore, and made other gifts to scientific and philanthropic institutions. He was educated at Caius College, Cambridge, and gave £25,000 to Cambridge for the School of Engineering.

B.S. Specification for Machine-Cut Gears.—This new specification deals with machine-cut gears connecting parallel shafts, the teeth being either straight, single or double-helical, and of the 20 deg. full-depth involute system (with a working height of twice the module) of the following classes:—Class A.—Precision ground or cut gears suitable for peripheral speeds exceeding 2,000 ft. per min. Class B.—High-class cut gears suitable for peripheral speeds between 750 and 3,000 ft. per min. Class C.—Commercial cut gears suitable for peripheral speeds below 1,200 ft. per min. In addition to dealing with the form of gear teeth, clearance, maximum permissible pitch errors and tolerances, the new specification lays down standard formulas for the strength and rating of gears, and includes a series of charts showing at a glance the proportions of gear wheels of different materials. Copies of this Specification (B.S.S. No. 436—1932) may be obtained from the British Standard Institution, Publication Department, 28, Victoria Street, London, S.W.1. Price 5s., 5s. 6d. post free.

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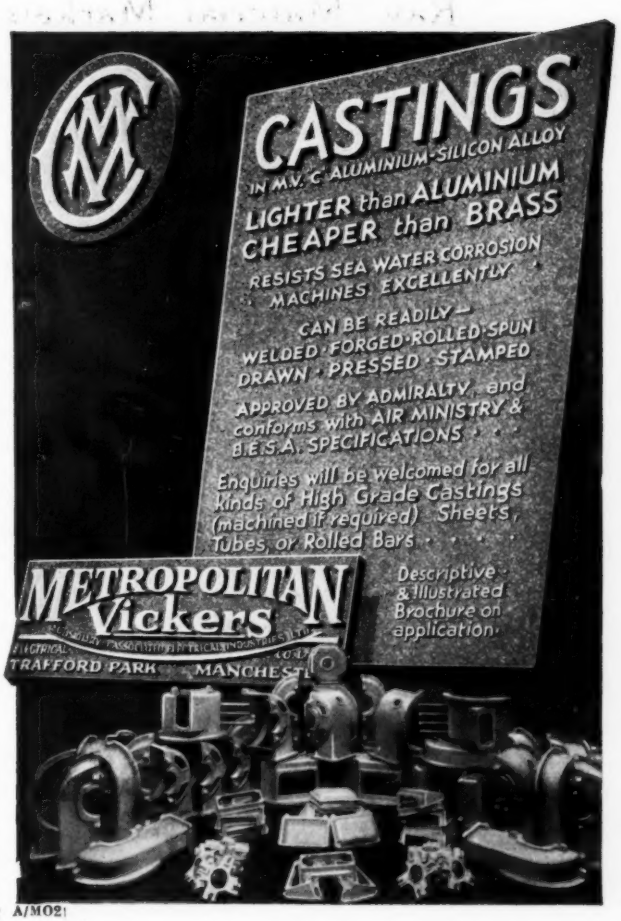
which has all to be imported, and is more expensive, when our "Carlton" Patent Blacking will give you as good, or even better, results.

We are prepared to send a large sample free, carriage paid, to any Iron Founder who will see that it gets a fair trial. We will not trouble you at all with Travellers or Circulars.

It can be used wet or dry.

THOMAS WILKINSON & Co.,
Limited,
MIDDLESBROUGH.


CASTINGS
IN M.V.C. ALUMINIUM-SILICON ALLOY
LIGHTER than ALUMINIUM
CHEAPER than BRASS
RESISTS SEA WATER CORROSION
MACHINES EXCELLENTLY
CAN BE READILY—
WELDED · FORGED · ROLLED · SPUN
DRAWN · PRESSED · STAMPED
APPROVED BY ADMIRALTY and conforms with AIR MINISTRY & B.E.S.A. SPECIFICATIONS
Enquiries will be welcomed for all kinds of High Grade Castings (machined if required) Sheets, Tubes, or Rolled Bars
Descriptive & Illustrated Brochure on application.
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TRAFFORD PARK MANCHESTER

A/M021

Raw Material Markets.

The announcement of further protection for the pig-iron and light-castings industries has considerably heartened the iron and steel markets. Imports of Continental iron will be considerably restricted, while the 33⅓ per cent. duty on foreign castings should considerably improve the position of the foundries, thus directly affecting the consumption of raw material. The additional protection, taken in conjunction with the initiation of the National Reorganisation Committee, afford hopes of a better future for the industry.

Business has been dull in the iron and steel markets during the week. Home consumers are confining their purchases to the minimum, while little consolation is to be found in the export department.

Pig-Iron.

MIDDLESBROUGH.—Local sales remain at a steady level, and the production of Cleveland iron is just about being absorbed. Fair sales are being made to Scotland, although at almost unremunerative prices. Hardly any export business is being done. Prices are unaltered, as follow:—No. 1 Cleveland foundry grade, 61s.; No. 3 Cleveland G.M.B., 58s. 6d.; No. 4 foundry, 57s. 6d.; No. 4 forge, 57s. per ton.

Business in East Coast hematite has been on a rather better scale during the last few days, and it is believed that a general recovery in the demand is not far off. Quotations have been lowered, owing to the prospective increase in production, mixed numbers now being at 62s. 6d. and No. 1 quality at 63s. per ton.

LANCASHIRE.—The demand for foundry iron remains limited, partly owing to the increasing quantities of good-quality scrap on offer, mainly broken-up textile machinery. Purchases of foundry iron are nearly all for early delivery, forward dates being little mentioned. Quotations, for delivery in the Manchester zone, are 67s. per ton for Staffordshire, Derbyshire and North-East Coast brands of No. 3, with Northamptonshire No. 3 at 65s. 6d., Derbyshire forge iron at 62s., Scottish No. 3 at from 86s. to 87s., and West Coast hematite at about 81s. Indian iron is not worth more than 75s. per ton.

MIDLANDS.—The iron and steel industry in this area is in an unsatisfactory position, none of the foundries being able to work full time. The present demand is insufficient to absorb the output, and the furnaces are having to put into stock. Northampton No. 3 remains at 62s. 6d. per ton, and North Staffordshire and Derbyshire and Lincolnshire No. 3 at 66s. per ton, delivered to Birmingham and Black Country stations.

SCOTLAND.—The Scottish foundries continue to be in a very difficult position. Many are closed down altogether, and the total demand for pig-iron is limited. There is no change in the official price of 69s. 6d. per ton for No. 3 foundry, with a minimum of 2s. 6d. per ton extra for No. 1, at furnaces. No. 3 Middlesbrough is not above 56s. 6d. at Grangemouth, with Midland iron at a shade less. Little English iron is being disposed of, however, at the moment.

Coke.

The coke market remains largely inactive. A few small spot purchases are being made, but there is no mention of forward business. Best Durham coke is quoted at 37s. 6d. per ton and upwards, with inferior grades down to 35s., whilst Welsh coke varies from 30s. to 45s. per ton, according to analysis, delivered Birmingham and district.

Steel.

Poor conditions prevail in the finished-steel trade. Only small miscellaneous orders are being given out, necessitating frequent changing of rolls. Business is on a similarly limited scale in the semis market. Little Continental material is now coming in, but large stocks are still held by consumers. There has been only a small response to the recent price reductions made by the home producers.

Scrap.

The demand for scrap iron in the Cleveland area is very limited, and prices are weak. Heavy cast-iron is at 36s. per ton, while no more than 37s. 6d. is offered for machinery quality. Light castings have receded to 33s. per ton. Little business is being done in the Midlands. In South Wales there is little demand from the foundries. Heavy cast iron in large pieces and furnace sizes is weak at 41s. to 42s. Good cast-iron machinery scrap for foundry purposes has met with a few sales at about 45s. A similar slackness is being experienced in the Scottish market, where prices are unaltered.

Metals.

Copper.—Following the passing of the 4 cents per lb. import duty on copper (to take effect from June 21), there has been a revival of interest in the American domestic market, and a certain amount of forward buying. Continental consumers have also been buying to a slightly better extent. Copper Exporters, Inc., continue to quote Customs metal at 5.50 cents c.i.f. Europe, but outside interests are prepared to sell at about 5.25 cents.

Closing quotations :—

Cash.—Thursday, £26 8s. 9d. to £26 10s.; Friday, £26 6s. 3d. to £26 7s. 6d.; Monday, £27 3s. 9d. to £27 5s.; Tuesday, £27 2s. 6d. to £27 5s.; Wednesday, £27 3s. 9d. to £27 5s.

Three Months.—Thursday, £26 5s. to £26 6s. 3d.; Friday, £26 3s. 9d. to £26 5s.; Monday, £27 to £27 1s. 3d.; Tuesday, £27 to £27 1s. 3d.; Wednesday, £26 18s. 9d. to £27.

Tin.—There was a sharp fall in the standard market at the end of last week, following various rumours which were subsequently denied by the Metal Exchange Committee. There was also a spurt of buying at the lower levels, particularly by American consumers, but the market soon fell again. Preparations are being made for the carrying out of the new output-restriction proposals, and only the final consent of the signatory bodies is awaited.

Official closing prices :—

Cash.—Thursday, £109 5s. to £109 10s.; Friday, £112 to £112 5s.; Monday, £115 to £115 5s.; Tuesday, £113 5s. to £113 10s.; Wednesday, £111 5s. to £111 7s. 6d.

Three Months.—Thursday, £111 15s. to £112; Friday, £114 10s. to £114 15s.; Monday, £117 10s. to £117 15s.; Tuesday, £115 10s. to £115 15s.; Wednesday, £113 15s. to £114.

Spelter.—The market has remained steady throughout the past week, but there has been little buying by consumers. Conditions are reported to be still very difficult in the galvanising industry. One satisfactory feature is the steady decline in the stocks held by the Cartel, but it is not known what stocks are held in private hands.

Daily fluctuations :—

Ordinary. — Thursday, £11 7s. 6d.; Friday, £11 10s.; Monday, £11 11s. 3d.; Tuesday, £11 8s. 9d.; Wednesday, £11 7s. 6d.

Lead.—The lead market is still unstable, and only a general revival in the consuming industries can pull matters round. Some small purchases have been made by consumers in this country, but the demand from the Continent remains very limited.

The week's prices have been :—

Soft Foreign (Prompt).—Thursday, £9 8s. 9d.; Friday, £9 11s. 3d.; Monday, £9 10s.; Tuesday, £9 5s.; Wednesday, £9 3s. 9d.

Waste-Heat Boilers at American Steel Plant.—The new open-hearth plant of the Illinois Steel Company at its South Works, Chicago, consists of fourteen 150-ton stationary furnaces, with provision for the installation of an additional furnace. The capacity of the fourteen units is estimated at 1,600,000 tons of ingots per annum, or sufficient for the needs of the wide-flange beam mill and the new slabbing and plate mills at the South Works. The charging side is served by two travelling cranes of 65-ft. span, each having 150-ton main hoist and 40-ton auxiliary. Hot metal is supplied in 100-ton ladles. Fourteen 640-h.p. waste-heat boilers of the horizontal fire-tube type, each having 7,960 sq. ft. of heating surface and 460 sq. ft. of superheaters, generate steam at 275 lbs. per sq. in.

Students' Corner.

(*Continued from page 360.*)

Q.—Can information be gained by reference to types of cupolas other than standard?

Answer Continued.

It is, in principle, a reverberatory furnace in which the oil burner enters on one side, whilst a charging platform is erected on the other side. The flame developed from the oil burner first sweeps the bath, strikes against the lower part of the charge of the cupola column in the charging shaft, and melts it down for running into the hearth, while fresh material is charged from above as in an ordinary cupola until the required amount is finished. The escaping gases sweep through the preheater and heat the blast air on the counter-current system. It is stated that blast temperatures of 400 to 600 deg. C. are being obtained. The slag is drawn off on the side opposite the tap hole—that is, of the hearth or bath. On the floor for charging the cupola there is a flap by which the shaft or bore of the cupola is easily accessible. Coal-tar oil is used as fuel. As in the cupola furnace, the charge is delivered from the charging stage with a lime addition of 1 to 2 per cent. No coke is being used. The temperature of the tapped metal is 1,500 to 1,600 deg. C. It is claimed that the improvement in the quality of grey cast iron melted by this method is low sulphur, fine graphite, and the possibility of obtaining with accuracy a uniformly low carbon content of the particular analysis desired.

(4) The jolting-hearth attachment to an ordinary cupola.—It is claimed that jolted iron not only desulphurises, but another important advantage is a very thorough degasification which makes the jolted molten iron much less liable to shrinkage, porosity and drawing. The jolting hearth is simply a receiver worked upon a mechanical cam principle which jolts the liquid iron received from the cupola. It is worked by a small motor, and the number of revolutions or shocks for cast iron is 100 per min. It is claimed that the jolting hearth requires no more attendance than an ordinary receiver. The tapper operates the switch lever of the motor at the proper moment to give the jolting.

(5) The Poumay cupola.—This cupola claims to be economical. The claims are a less coke consumption, quicker melting and cleaner iron. The chief difference between this cupola and the ordinary form is that it incorporates several small additional air inlets above the wind-belt winding around the outside of the cupola shell. Exactly what they are supposed to do is not quite clear; presumably the idea is to burn any CO formed to CO_2. Recollections are still fresh of seeing a similar cupola very many years ago, claiming to give a good melted iron on a much less coke consumption. The results were disappointing, and after a lengthy trial the supplementary air inlets were removed. However, the Poumay cupola is giving satisfaction. If a certain melting unit, whatever its type, shows in practice an advantage, its adoption by the users is justified, of ten adjustments change a failure into a success. After all, the cupola that will show the best results is the one that is correctly designed, consistently operated, a sufficiency only of fuel, flux and volume of air, the correct weight and composition of the charges, coupled with correct methods of charging, a cupola will then give its best.

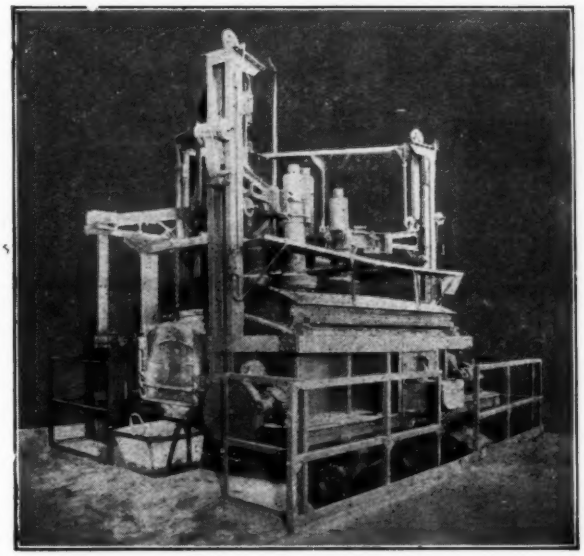
(*To be continued.*)

GREAVES-ETCHELLS ELECTRIC STEEL FURNACES

MORE THAN 100 FURNACES SUPPLIED DURING LAST 7 YEARS.

WATSON ROTATING ELECTRIC FURNACES Ensure RAPID & CLEAN MELTING

THOROUGH MIXING.



NON-FERROUS METAL MELTING ELECTRIC FURNACES

SINGLE, TWO, or THREE PHASE.

CONTRACTORS TO HOME AND FOREIGN GOVERNMENTS.

WATSONS (METALLURGISTS) LIMITED

Lancaster Street, SHEFFIELD.

CAST IRON FLANGED PIPES

2 in.–12 in. & CONNECTIONS. to 24 in. dia.

WE HAVE FIFTY-TWO YEARS OF ACCUMULATED EXPERIENCE AND METAL PATTERNS.

JAMES & RONALD RITCHIE, LTD.,

Telephone: 3852 (2 Lines). MIDDLESBROUGH. Telegrams: "Ritchie, Middlesbrough."

WEEKLY PRICE CURRENT.

COPPER.

	£	s.	d.
Standard cash	27	3	9
Three months	26	18	9
Electrolytic	31	0	0
Tough	29	5	0
Best selected	29	15	0
Sheets	59	0	0
India	40	0	0
Wire bars	33	10	0
Do., July	32	10	0
Do., Aug.	31	10	0
Ingot bars	33	10	0
H.C. wire rods	34	15	0
Off. av. cash, May	28	11	11½
Do., 3 mths., May	28	12	7 1/4
Do., Sttlmnt., May	28	11	9½
Do., Electro, May	33	6	8
Do., B.S., May	31	16	4⅝
Do., wire bars, May	33	16	8
Solid drawn tubes			9½d.
Brazed tubes			9½d.
Wire			6½d.

BRASS.

Solid drawn tubes	9d.
Brazed tubes	11d.
Rods, drawn	7½d.
Rods, extd. or rlld.	4½d.
Sheets to 10 w.g.	7½d.
Wire	7½d.
Rolled metal	6¼d.
Yellow metal rods	4½d.
Do. 4 × 4 Squares	5½d.
Do. 4 × 3 Sheets	5½d.

TIN.

	£	s.	d.
Standard cash	111	5	0
Three months	113	15	0
English	113	0	0
Bars	117	0	0
Straits	117	10	0
Australian	115	5	0
Eastern	121	5	0
Banca (nom.)	121	5	0
Off. av. cash, May	122	7	6
Do., 3 mths., May	124	10	1½
Do., Sttlmt., May	122	8	1½

SPELTER.

	£	s.	d.
Ordinary	11	7	6
Remelted	10	5	0
Hard	9	0	0
Electro 99.9	14	0	0
English	12	7	6
India	11	0	0
Zinc dust	20	0	0
Zinc ashes	1	15	0
Off. aver., May	12	11	1½
Aver. spot, May	12	8	7½

LEAD.

	£	s.	d.
Soft foreign ppt.	9	3	9
Empire	10	0	0
English	11	5	0
Off. average, May	10	17	1
Average spot, May	10	13	5½

ZINC SHEETS, &c.

	£	s.	d.
Zinc sheets, English	23	0	0
Do., V.M. ex-whf.	20	10	0
Rods	27	0	0
Boiler plates			—
Battery plates			—

ANTIMONY.

	£	s.	d.		£	s.	d.
English	35	0	0	to	42	10	0
Chinese					23	0	0
Crude					16	0	0

QUICKSILVER.

	£	s.	d.
Quicksilver	12	0	0

FERRO-ALLOYS AND STEEL-MAKING METALS.

Ferro-silicon—	
25%	£8 5 0
45/50%	£13 10 0
75%	£19 0 0
Ferro-vanadium—	
35/50%	12/8 lb. Va.
Ferro-molybdenum—	
70/75% c. free, of Mo.	6/3 per lb.
Ferro-titanium—	
23/25% carbon-free	11d. lb.
Ferro-phosphorus, 20/25%	£21 0 0
Ferro-tungsten—	
80/85%	2/- lb.
Tungsten metal powder—	
98/99%	2/3½ lb.
Ferro-chrome—	
2/4% car.	£27 15 0
4/6% car.	£25 0 0
6/8% car.	£24 10 0
8/10% car.	£23 15 0
Ferro-chrome—	
Max. 2% car.	£37 10 0
Max. 1% car.	£47 2 6
Max. 0.70% car.	£49 10 0
70% carbon-free	1/1 lb.
Nickel—80/99.5%	£225 to £230
"F" nickel shot	£207 0 0
Ferro-cobalt	8/9 lb.
Aluminium 98/99%	£95 0 0
Metallic chromium—	
96/98%	2/9 lb.
Ferro-manganese (net)—	
76/80% loose	£10 15 0 to £11 5 0
76/80% packed	£11 15 0 to £12 5 0
76/80% export (nom.)	£9 0 0
Metallic manganese—	
94/96% carbon-free	1/4 lb.

Per ton unless otherwise stated.

HIGH-SPEED TOOL STEEL.

Finished bars, 14% tungsten	2s. 0d.
Finished bars, 18% tungsten	2s. 9d.

Per lb. net, d/d buyers' works.

Extras—

Rounds and squares, 3 in. and over	4d. lb.
Rounds and squares, under ½ in. to ¼ in.	3d. lb.
Do., under ¼ in. to 7/32 in.	1/- lb.
Flats, ½ in. × ¼ in. to under 1 in. × ⅛ in.	3d. lb.
Do., under ¼ in. × ¼ in.	1/- lb.
Bevels of approved sizes and sections	6d. lb.

Bars cut to length, 10% extra.

SCRAP.

	£	s.	d.		£	s.	d.
South Wales—							
Heavy steel	1	18	0	to	1	19	0
Bundled steel and shrngs.	1	16	0	to	1	17	0
Mixed iron and steel	1	15	0	to	1	17	0
Heavy cast iron	2	1	0	to	2	2	0
Good machinery for foundries					2	5	0
Cleveland—							
Heavy steel					1	15	0
Steel turnings					1	12	6
Cast-iron borings					1	6	0
Heavy forge					2	12	6
W.I. piling scrap					2	5	0
Cast-iron scrap	1	16	0	to	1	17	6
Midlands—							
Light cast-iron scrap					1	15	0
Heavy wrought iron					2	10	0
Steel turnings, f.o.r.					0	19	0
Scotland—							
Heavy steel					1	17	6
Ordinary cast iron					2	1	6
Engineers' turnings					1	8	6
Cast-iron borings					1	10	0
Wrought-iron piling					2	2	6
Heavy machinery					2	6	0

London—Merchants' buying prices delivered yard.

	£	s.	d.
Copper (clean)	23	0	0
Brass	15	0	0
Lead (less usual draft)	7	10	0
Tea lead	5	10	0
Zinc	6	10	0
New aluminium cuttings	62	0	0
Brassiery copper	19	0	0
Gunmetal	19	0	0
Hollow pewter	70	0	0
Shaped black pewter	50	0	0

PIG-IRON.

(f.o.t. unless otherwise stated.)

N.E. Coast—	
Foundry No. 1	61/-
Foundry No. 3	58/6
Foundry No. 4	57/6
Forge No. 4	57/-
Hematite No. 1	63/-
Hematite M/Nos.	62/6
N.W. Coast—	
Hem. M/Nos. d/d Glas.	72/-
„ d/d Birm.	84/6
Malleable iron d/d Birm.	117/6
Midlands—	
Staffs common*	—
„ No. 4 forge*	61/-
„ No. 3 fdry.*	66/-
Shrops basic	—
„ Cold blast, ord.	—
„ „ roll iron	—
Northants forge*	57/6
„ fdry. No. 3*	62/6
„ fdry. No. 1*	65/6
Derbyshire forge*	61/-
„ fdry. No. 3*	66/-
„ fdry. No. 1*	69/-
„ basic*	—

*d/d Black Country dist.

Scotland—	
Foundry No. 1	72/-
„ No. 3	69/6
Hem. M/Nos. d/d	68/6
Sheffield (d/d district)—	
Derby forge	58/6
„ fdry. No. 3	63/6
Lincs forge	—
„ fdry. No. 3	63/6
E.C. hematite	75/6
W.C. hematite	83/6
Lancashire (d/d eq. Man.)—	
Derby forge	62/-
„ fdry. No. 3	67/-
Staffs fdry. No. 3	67/-
Northants fdry. No. 3	65/6
Cleveland fdry. No. 3	67/-
Dalzell, No. 3 (special)	102/6 to 105/-
Glengarnock, No. 3	86/- to 87/-
Clyde, No. 3	86/- to 87/-
Monkland, No. 3	86/- to 87/-
Summerlee, No. 3	86/- to 87/-
Eglinton, No. 3	86/- to 87/-
Gartsherrie, No. 3	86/- to 87/-
Shotts, No. 3	86/- to 87/-

FINISHED IRON AND STEEL.

Usual District deliveries for iron; delivered consumers' station for steel.

Iron—	£	s.	d.		£	s.	d.
Bars (cr.)	9	7	6	to	9	15	0
Nut and bolt iron	7	15	0	to	8	10	0
Hoops	10	10	0	to	12	0	0
Marked bars (Staffs) f.o.t.					12	0	0
Gas strip	10	10	0	to	12	0	0
Bolts and nuts, ¾ in. × 4 in.					12	0	0
Steel—							
Plates, ship, etc.	8	15	0	to	8	17	6
Boiler plts.	8	7	6	to	9	5	0
Chequer plts.					10	7	6
Angles					8	7	6
Tees					9	7	6
Joists					8	15	0
Rounds and squares, 3 in. to 5½ in.					9	7	6
Rounds under 3 in. to ¼ in. (Untested)	6	12	6	& up.			
Flats—8 in. wide and over					8	12	6
„ under 8 in. and over 5 in.					8	17	6
Rails, heavy	8	5	0	to	8	10	0
Fishplates					12	0	0
Hoops (Staffs)					9	10	0
Black sheets, 24g.	8	0	0	to	8	10	0
Galv. cor. shts.	9	5	0	to	10	0	0
Galv. flat shts.	9	15	0	to	11	0	0
Galv. fencing wire, 8g. plain					12	7	6
Billets, soft	4	17	6	to	5	7	6
Billets, hard					6	12	6
Sheet bars	4	15	0	to	5	5	0
Tin bars					4	15	0

PHOSPHOR BRONZE.

	Per lb. basis.
Strip	10½d.
Sheet to 10 w.g.	11½d.
Wire	11½d.
Rods	10½d.
Tubes	16d.
Castings	12d.

Delivery 3 cwt. free.
10% phos. cop. £30 above B.S.
15% phos. cop. £35 above B.S.
Phosphor tin (5%) £30 above price of English ingots.
C. Clifford & Son, Limited.

NICKEL SILVER, &c.

	Per lb.
Ingots for raising	7d. to 1/1
Rolled—	
To 9 in. wide	1/1 to 1/7
To 12 in. wide	1/1½ to 1/7½
To 15 in. wide	1/1½ to 1/7½
To 18 in. wide	1/2 to 1/8
To 21 in. wide	1/2½ to 1/8½
To 25 in. wide	1/3 to 1/9
Ingots for spoons and forks	7d. to 1/3½
Ingots rolled to spoon size	10d. to 1/6½
Wire round—	
to 10g.	1/4½ to 1/11½

with extras according to gauge.
Special 5ths quality turning rods in straight lengths, 1/3½ upwards.

AMERICAN IRON AND STEEL.

At Pittsburgh unless otherwise stated.

	Dols.
No. 2 foundry, Phila.	14.84
No. 2 foundry, Valley	14.50
No. 2 foundry, Birm.	11.00
Basic	15.89
Bessemer	16.89
Malleable	16.89
Grey forge	16.39
Ferro-mang. 80%, seaboard	75.00
O.-h. rails, h'y, at mill	43.00
Billets	27.00
Sheet bars	26.00
Wire rods	37.00
	Cents.
Iron bars, Phila.	2.11
Steel bars	1.60
Tank plates	1.60
Beams, etc.	1.60
Skelp, grooved steel	1.60
Skelp, sheared steel	1.60
Steel hoops	1.65
Sheets, black, No. 24	2.20
Sheets, galv., No. 24	2.85
Wire nails	1.95
Plain wire	2.20
Barbed wire, galv.	2.60
Tinplates, 100-lb. box	$4.75

COKE (at ovens).

Welsh foundry	22/6 to 25/-
„ furnace	17/- to 18/-
Durham and Northumberland—	
„ foundry	21/- to 25/-
„ furnace	13/- to 13/6
Midlands, foundry	—
„ furnace	—

TINPLATES.

f.o.b. Bristol Channel ports.

I.C. cokes	20×14 per box	14/6 to 15/-
„	28×20 „	29/- to 30/-
„	20×10 „	—
„	18¾×14 „	—
C.W.	20×14 „	—
„	28×20 „	—
„	20×10 „	—
„	18¾×14 „	—

SWEDISH CHARCOAL IRON & STEEL.

Pig-iron	£6	0	0	to	£7	0	0
Bars, hammered, basis	£16	10	0	to	£17	0	0
Bars and nail-rods, rolled, basis	£15	17	6	to	£16	5	0
Blooms	£10	0	0	to	£12	0	0
Keg steel	£32	0	0	to	£33	0	0
Faggot steel	£18	0	0	to	£23	0	0
Bars and rods dead soft, st'l	£10	0	0	to	£12	0	0

All per English ton, f.o.b. Gothenburg.
[Subject to an exchange basis of Kr. 18.16 to £1.]

DAILY FLUCTUATIONS.

Standard Copper (cash).

		£	s.	d.		
June	9 ..	26	8	9	dec.	7/6
„	10 ..	26	6	3	„	2/6
„	13 ..	27	3	9	inc.	17/6
„	14 ..	27	2	6	dec.	1/3
„	15 ..	27	3	9	inc.	1/3

Electrolytic Copper.

		£	s.	d.		
June	9 ..	30	10	0	No change	
„	10 ..	30	10	0	„	„
„	13 ..	31	0	0	inc.	10/-
„	14 ..	31	0	0	No change	
„	15 ..	31	0	0	„	„

Standard Tin (cash).

		£	s.	d.		
June	9 ..	109	5	0	dec.	130/-
„	10 ..	112	0	0	inc.	55/-
„	13 ..	115	0	0	„	60/-
„	14 ..	113	5	0	dec.	35/-
„	15 ..	111	5	0	„	40/-

Tin (English ingots).

		£	s.	d.		
June	9 ..	110	15	0	dec.	130/-
„	10 ..	113	15	0	inc.	60/-
„	13 ..	116	10	0	„	55/-
„	14 ..	115	0	0	dec.	30/-
„	15 ..	113	0	0	„	40/-

Spelter (ordinary).

		£	s.	d.		
June	9 ..	11	7	6	dec.	7/6
„	10 ..	11	10	0	inc.	2/6
„	13 ..	11	11	3	„	1/3
„	14 ..	11	8	9	dec.	2/6
„	15 ..	11	7	6	„	1/3

Spelter (Electro, 99.9 per cent.).

		£	s.	d.		
June	9 ..	14	0	0	dec.	10/-
„	10 ..	14	0	0	No change	
„	13 ..	14	0	0	„	„
„	14 ..	14	0	0	„	„
„	15 ..	14	0	0	„	„

Zinc Sheets (English).

		£	s.	d.		
June	9 ..	23	0	0	No change	
„	10 ..	23	0	0	„	„
„	13 ..	23	0	0	„	„
„	14 ..	23	0	0	„	„
„	15 ..	23	0	0	„	„

Lead (English).

		£	s.	d.		
June	9 ..	11	10	0	dec.	5/-
„	10 ..	11	10	0	No change	
„	13 ..	11	10	0	„	„
„	14 ..	11	5	0	dec.	5/-
„	15 ..	11	5	0	No change	

Imports and Exports of Iron and Steel Castings in May and the five months 1932, compared with May and the five months 1931.

	May, 1931.	May, 1932.	Five months, 1931.	Five months, 1932.	May, 1931.	May, 1932.	Five months, 1931.	Five months, 1932.
Imports.	Tons.	Tons.	Tons.	Tons.	£	£	£	£
Pipes and Fittings, Cast	1,367	96	5,486	1,441	18,241	2,084	72,304	25,387
Castings, in the Rough, Iron	128	124	789	480	2,882	1,281	16,203	8,398
„ „ „ Steel	587	112	2,851	904	11,237	1,767	60,812	17,970
Hollow-ware, Cast, not Enamelled	11	2	28	5	824	167	2,033	431
„ „ Enamelled	3	1	36	48	185	59	1,630	1,631
Exports.								
BUILDERS' CASTINGS—								
To Argentine Republic	34	55	392	215	1,260	1,396	16,724	7,834
„ Irish Free State	325	341	1,578	1,719	15,318	16,137	77,254	76,782
„ British South Africa	224	124	786	721	8,315	4,012	31,055	25,643
„ „ India	135	50	614	410	4,760	2,028	21,166	14,641
„ New Zealand	26	33	214	112	1,452	1,331	13,437	6,086
Total (including other countries)	1,030	986	5,340	4,972	43,985	40,082	240,420	205,029
PIPES AND FITTINGS—CAST—								
To Argentine Republic	370	135	3,088	1,044	3,524	1,482	29,491	11,113
„ Irish Free State	1,827	842	5,088	3,524	19,247	12,095	58,927	48,941
„ British South Africa	735	134	4,309	2,370	8,822	1,961	50,828	28,628
„ „ India	127	88	780	538	1,729	1,522	14,126	8,425
„ Straits Settlements and Malay States	80	178	821	1,268	1,584	1,945	11,135	12,792
Total (including other countries)	7,426	6,007	32,006	29,957	85,704	61,619	369,093	307,419
HOLLOW-WARE—								
Cast, not Enamelled, and Cast, Tinned	169	220	989	1,000	6,288	7,938	34,360	35,569
„ Enamelled	30	103	216	353	3,458	8,264	22,481	29,373
CASTINGS, in the rough—								
Iron	215	79	763	375	4,446	3,167	23,362	15,076
Steel	24	70	655	386	1,149	3,193	21,785	15,809

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SMALL ADVERTISEMENTS.

Notice.

Small Advertisements in this section of the Journal are accepted at the prepaid rate of 6d. per line, first line in capitals counting two, average 6 words per line. Minimum charge for one insertion 3/-

(A remittance should accompany instructions.)

SITUATIONS WANTED.

FOREMAN Moulder seeks position; 10 years in charge of plate and machine foundry of large engineering firm; excellent reference; age 48.—Box 206, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FOUNDRY Manager and Engineer, A.M.I.Mech.E., age 45, seeks reappointment; exceptional experience in all branches of foundry work, pattern and machine shops; 22 years' experience in management; could take full control of both technical and commercial side of the business; highest references.—Box 204, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

FOUNDRY Works Manager desires position; practical and technical training all branches iron and non-ferrous, thorough knowledge of stainless steel, expert on cupola, experienced engineering and patternshop; good organiser.—Box 166, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

METALLURGICAL and Analytical Chemist desires post in foundry or works laboratory; age 30 years; 12 years' practical and technical experience and general management with marine engineering firm manufacturing cast-iron and semi-steel castings, etc.; highest references.—Box 202, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

EMPLOYMENT REGISTER.

Conducted by the Institute of British Foundrymen by courtesy of the proprietors of THE FOUNDRY TRADE JOURNAL.

Correspondence should be addressed to the General Secretary, Institute of British Foundrymen, St. John Street Chambers, Deansgate, Manchester, from whom full particulars can be obtained of this service.

Any employer wishing to communicate with a candidate should write to the General Secretary, quoting identification number.

FOREMAN MOULDER seeks position; 10 years in charge of plate and machine foundry of large engineering firm. Excellent references. Age 48. (177)

EXPERIENCED Foundry Foreman requires position. Experience on machine moulding, pipe founding, and general engineering castings. Technical training. (178)

FOUNDRY and General Works Foreman disengaged; 30 years' experience in production of intricate light castings, for music, engineering and electrical trades, also in the assembling, enamelling and stoving. (179)

EXPERIENCED Foundry Manager, 15 years in charge of well-known foundries doing highest-class iron and non-ferrous castings, requires position. Latest position complete control, works and commercial. Exceptional experience special irons, including Perlit. (180)

FOUNDRY Foreman, age 39, requires position; 16 years' experience in charge of foundries. Cast-iron, semi-steel, aluminium and all non-ferrous alloys, also repetition work and light castings. (181)

SITUATIONS WANTED—*Contd.*

POSITION required as Foundry Manager or Head Foreman. First-class experience in iron and non-ferrous foundries. Machine moulding, die casting, special irons. Young. Excellent references. (182)

AGENCY.

AGENTS wanted on Commission Basis in London area to represent foundry doing iron and non-ferrous castings.—Write, giving full particulars, to Box 200, Offices of THE FOUNDRY TRADE JOURNAL, 49, Wellington Street, Strand, London, W.C.2.

PATENT.

THE Proprietor of British Patent No. 308517, dated May 30, 1928, relating to "Improvement in a Hot Top for Ingot Moulds," is desirous of entering into arrangements by way of a licence or otherwise on reasonable terms for the purpose of exploiting the above patent and ensuring its practical working in Great Britain.—Inquiries to B. Singer, Steger Building, Chicago, Illinois.

PUBLICATION.

RYLAND'S DIRECTORY of the Coal, Iron, Steel, Tinplate, Metal, Engineering, Hardware and Allied Trades. 1932 edition. Now ready. Price 42s., bound in cloth.—INDUSTRIAL NEWSPAPERS, LTD., 49, Wellington Street, Strand, London, W.C.2.

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'Phone: Bearwood 1103.

MACHINERY—*Continued.*

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2 STIRLING W.T. BOILERS, 160 lbs. press.
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3-Ton "Evans"	... ...	£24
2-Ton "Evans"	... ...	£19

PNEUMATIC MACHINES

14″×16″ Mumford split pattern	2 @ £35
No. 2 Britannia Jolters	... 2 @ £36
No. 0 Britannia Jolters	... 4 @ £20
Core Jolters, 3″ Cylinder new, unused	... £4 each

ABOVE ARE AS NEW.

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ALEX. HAMMOND, *Foundry Machinery Merchant,*
14, AUSTRALIA ROAD, SLOUGH

PETER—WITH ONE EXCEPTION

With one exception Peter is an ordinary little fellow. Chubby, likeable, just five-and-a-half, full of life and fun, and on occasions—be it admitted—of naughtiness. Just now Peter's rather important, for this is his first term at school, and he's grappling with the intricacies of "A B C" and "Twice-Two": difficult subjects to all men of five-and-a-half, but even more difficult in Peter's case because—bad luck—he's totally blind. That's his One Exception. Peter learns reading, writing, and 'rithmetic through the medium of "Braille"—dull stuff compared with the coloured picture books of most five-and-a-halfs. However, he's a stout lad is Peter, and he's making great progress.

Would you like to know more about him? How, in spite of his "One Exception," he is being educated and, when older, technically trained and usefully employed. There is a long waiting list of "Peters" throughout the British Isles, for whom training and accommodation must be provided in the immediate future.

Will you help with a donation or annual subscription? Any sum, large or small, will be gratefully received.

Here's a suggestion. Your eyesight is worth 3d. a year to you. Send Peter and his handicapped pals 3d. for every year you've had it. Now, please, in case it slips your memory. Good idea?

The Chairman,

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(FOUNDED 1850)
SWISS COTTAGE, LONDON, N.W.3